FIRST AID
TO THE INJURED

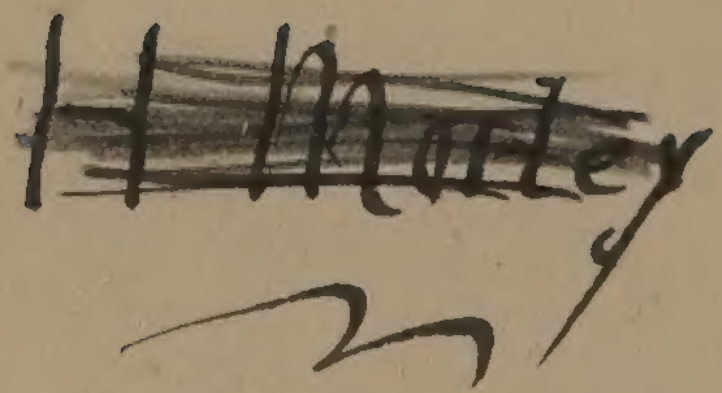
1892 1893
UNITED STATES OF AMERICA
1 POSTAGE ONE CENT 1
COLUMBUS IN SIGHT OF LAND

FIRST AID TO THE INJURED.

JAMES KING.

Full particulars of the work of the Association can be obtained from the

SECRETARY,
ST. JOHN AMBULANCE ASSOCIATION,
ST. JOHN'S GATE,
CLERKENWELL, LONDON, E.C.



"FIRST AID TO THE INJURED:"

Being the Hand-book describing Aids for Cases of Injuries or Sudden Illness.

ORIGINALLY WRITTEN BY

PETER SHEPHERD, M.B.,

SURGEON-MAJOR, ARMY MEDICAL DEPARTMENT;
HONORARY ASSOCIATE, ORDER OF ST. JOHN OF JERUSALEM.
[*Killed at Isandula, January* 22, 1879.]

REVISED AND RE-ARRANGED BY

ROBERT BRUCE,

WITH ILLUSTRATIONS BY

JOHN H. EASTERBROOK,

ESQUIRE AND SECRETARY OF THE ORDER OF ST. JOHN OF JERUSALEM,

AND NOW

EDITED AND RE-WRITTEN BY THE SAID

ROBERT BRUCE,

MEMBER OF THE ROYAL COLLEGE OF SURGEONS, ENGLAND;
HONORARY ASSOCIATE, ORDER OF ST. JOHN OF JERUSALEM;
Lecturer and Examiner to St. John Ambulance Association.

450th THOUSAND.

Price 1s. net; post free, 1s. 1d.

TO BE OBTAINED AT

ST. JOHN'S GATE, CLERKENWELL, LONDON, E.C.

1895.

[*All Rights Reserved.*]

CONTENTS.

CHAPTER I.

ANATOMY AND PHYSIOLOGY.

	PAGE
BONES	11
JOINTS	15
MUSCLES	16
ORGANS OF CIRCULATION	17
ARTERIES	18
VEINS	18
CAPILLARIES	18
HEART	18
ORGANS OF RESPIRATION	21
LUNGS	21
INSPIRATION	23
EXPIRATION	23
NERVOUS SYSTEM	24

CHAPTER II.

HÆMORRHAGE, OR BLEEDING.

VENOUS BLEEDING	25
CAPILLARY ,,	25
ARTERIAL ,,	26
TOURNIQUET	26

CHAPTER III.

FRACTURES.

SIMPLE FRACTURE.	33
COMPOUND FRACTURE	33
COMMINUTED ,,	33
COMPLICATED ,,	33
DISLOCATION	35
SPECIAL FRACTURES	35
TEMPORARY SPLINTS	43

CHAPTER IV.

INSENSIBILITY.

PAGE

Apoplexy 46
Epilepsy 47
Concussion of Brain 48
Fainting 49
Alcoholic Poisoning 50
Opium ,, ... 51
Hysterical Fits 51

CHAPTER V.

WOUNDS, ETC.

Bites of Animals 52
Adder and Snake Bites 53
Burns 53
Scalds 53
Frostbite 54
Sunstroke 55
Poisoning 55
Foreign Bodies in the Eye 57
,, ,, Ear 57

CHAPTER VI.

ARTIFICIAL RESPIRATION . 58

CHAPTER VII.

BANDAGING.

Esmarch's Bandage 64

CHAPTER VIII.

CARRYING PATIENTS.

Temporary Stretchers 71

CHAPTER IX.

CARRYING STRETCHERS . . 79

CHAPTER X.

FIFTH LECTURE FOR FEMALE CLASSES . 90

PREFACE.

This Manual is intended to give instructions to non-professional persons, to enable them to render first aid to those injured in the many accidents occurring in our daily life, or in cases of sudden illness. It is designed with the view of extending the work so well begun by the late Surgeon-Major Peter Shepherd, who wrote the first handbook used by the St. John Ambulance Association, and whose untimely death at Isandula in 1879 has always been deeply regretted.

ROBERT BRUCE.

MILFORD-ON-SEA, HANTS,
1893.

INTRODUCTION

TO ORIGINAL EDITION.

At the request of the Members of the Central Ambulance Committee of the Order of St. John of Jerusalem, I have hurriedly arranged the following Manual for the use of the Metropolitan Police and the other Ambulance Classes now organised by the Order of St. John in all parts of England.

The careful work which I should like to have bestowed has been rendered impossible by the exigencies of the Service requiring me to proceed on foreign service.

I have been aided by kind and able coadjutors, who have given their knowledge and experience.

I trust that this Handbook, given cheerfully and gratuitously—like all the work conducted for and by the Order—will be found to be in some degree "PRO UTILITATE HOMINUM."

P. SHEPHERD.

JUNIOR UNITED SERVICE CLUB,
LONDON, S.W.,
30*th October*, 1878.

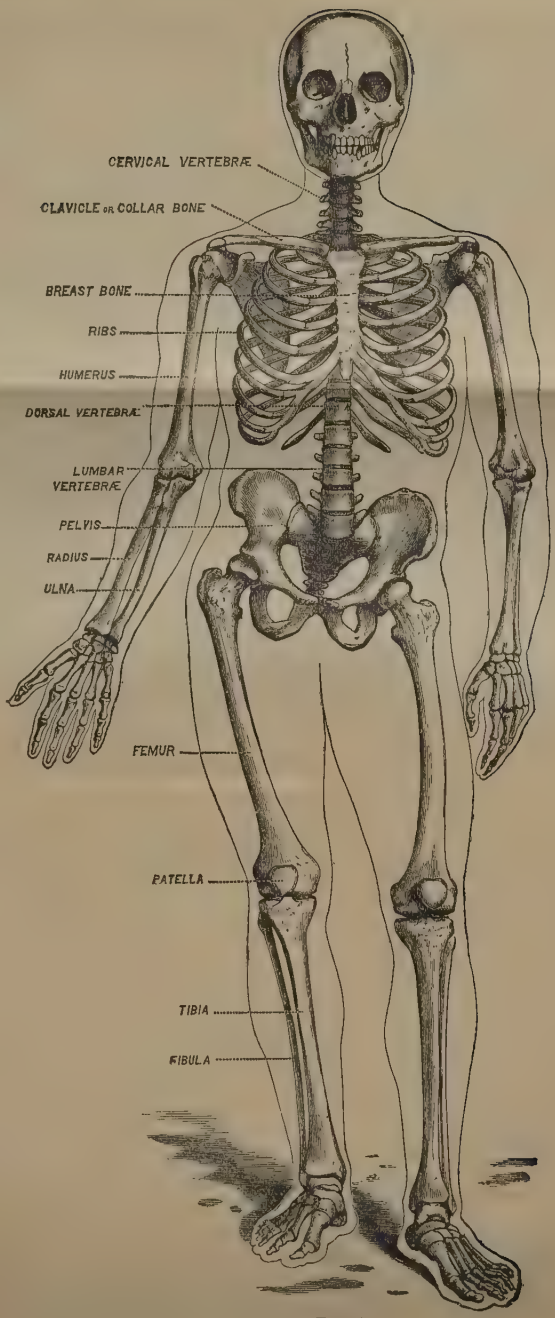

CERVICAL VERTEBRÆ
CLAVICLE OR COLLAR BONE
BREAST BONE
RIBS
HUMERUS
DORSAL VERTEBRÆ
LUMBAR VERTEBRÆ
PELVIS
RADIUS
ULNA
FEMUR
PATELLA
TIBIA
FIBULA

FIG 1.

FIRST AID TO THE INJURED.

Chapter I.

ANATOMY AND PHYSIOLOGY.

BONES.

For the purpose of description, we may divide the body into the *Trunk*, comprising the thorax, or chest, and the abdomen, or belly; the *Head*, comprising the brain-case and face; the *Upper Limbs*, the arms; and the *Lower Limbs*, the legs.

The framework upon which the body is built is called the skeleton (Fig. 1), formed of over

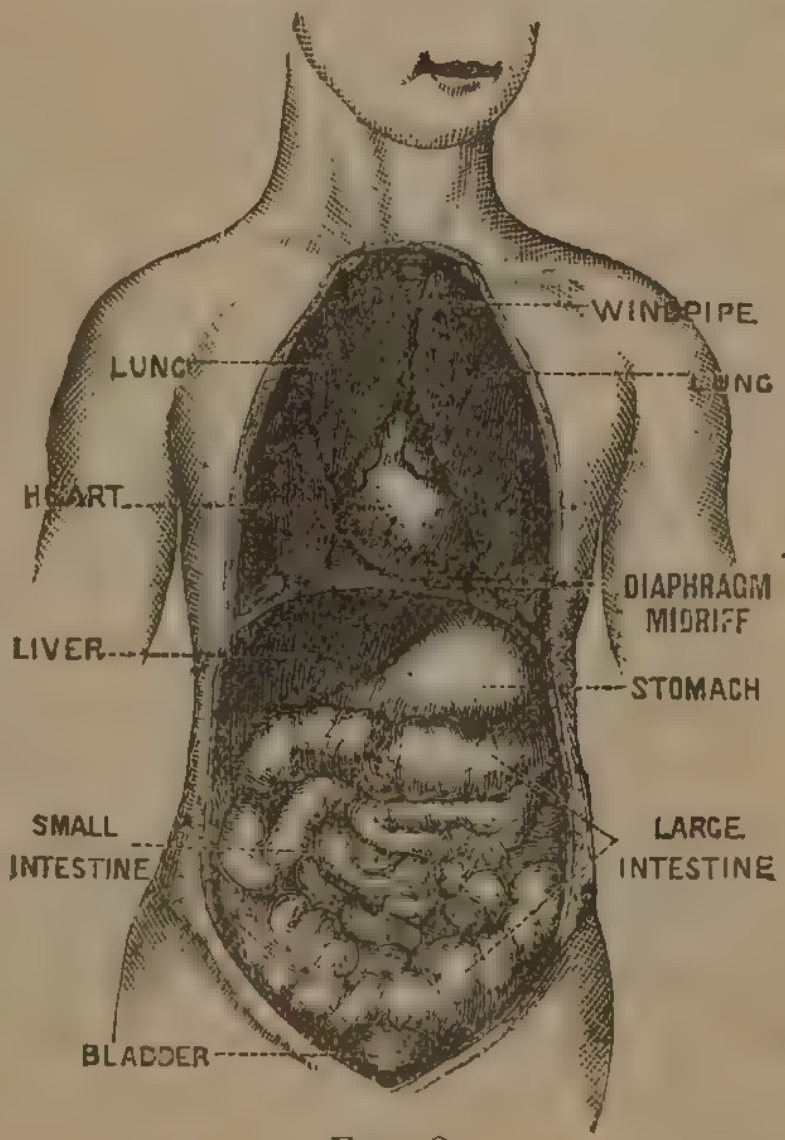


Fig. 2.

the shoulders are two double-curved bones, called the Clavicles, or Collar-bones.

The bones of the upper extremity are long thin bones, as they have to support no weight, but require to be moved about very freely. In the Arm is one bone, called the Humerus ; in the fore-arm are two, the Radius on the thumb side and the Ulna on the inside, and situated

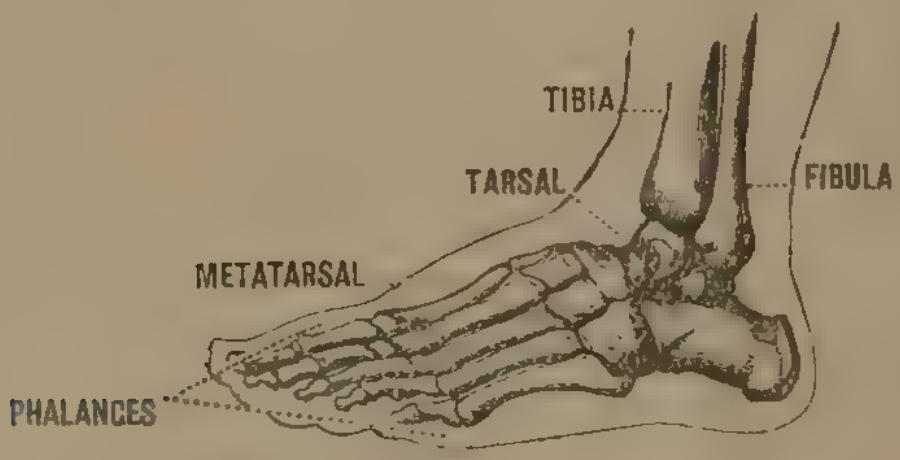


Fig. 3.

between them and the long bones of the hand is the Wrist, which consists of eight small bones arranged in two rows, and joined firmly together.

In the Hand, besides the wrist-bones, are nineteen bones, five in the palm, called the Metacarpal bones, the remaining fourteen, called the Phalanges, in the fingers and thumb ; each finger has three bones, but the thumb has only two.

In the lower extremity the bones are very strong, as they have to support the weight of the body.

On the outer side of the haunch-bone is a deep cup-like depression, in which is inserted the head of the Femur, or thigh-bone.

In the thigh is one bone, called the Femur ; in the leg are two, the Tibia or shin-bone on the inside, and the Fibula or brooch-bone on the outside. The lower ends form an arch, which rests upon one of the bones of the foot.

The front of the knee joint is protected by a small bone, the Patella, or knee-cap.

In the foot are several bones, arranged in the form of a double arch, one extending from the heel to the toes, the other from one side of the foot to the other. These bones are strong and thick, and joined firmly together, so that there is no movement between them except at the toes.

JOINTS.

When two or more bones come together they form a joint ; modifications of the "ball and socket" and the "hinge" being the most common kinds. The ends of the bones forming the joints are larger than their middles, or shafts ; they are coated with a layer of gristle, or cartilage, which acts as a buffer, and prevents pain being caused when the bones move upon each other ; over this cartilage is a skin, or membrane, which makes an oily fluid, to lubricate the parts and to enable them to move freely.

The bones are kept in position by a number of bands of fibrous tissue, which completely surround their ends.

MUSCLES.

The bones are moved by the Muscles, the masses of

FIG. 4.
MUSCLE AT REST.

FIG 5.
MUSCLE IN ACTION.

red flesh which make up the bulk of the body. These are arranged and shaped according to their work : where they move or lift heavy weights they are in thick masses, as in the thigh or arm, but where they have to cover in

cavities, as in the cheeks and abdomen, they are thin and flat.

A Muscle is made up of a number of bundles of fibres, like bundles of threads, enclosed in a tough sheath. This sheath is at each end much thickened, forming a tendon by which the muscle is attached to the part it acts upon. This tendon also takes the place of a muscle in passing over a joint ; thus, in the arm, the muscles acting upon the hand begin around the elbow and the upper part of the fore-arm, about the middle of the fore-arm we find the tendons taking the place of the muscles, and passing over the wrist to the fingers. If the muscle continued right down to the fingers, the action of the wrist would be greatly impeded.

When a muscle acts, one end is fixed, the middle of the muscle shortens and gets thicker, and thus draws its free end towards the fixed one (Figs. 4 and 5).

ORGANS OF CIRCULATION.

The different parts and organs of the body are supplied with food for their growth and support by a fluid called Blood. The blood circulates round the body through tubes called Arteries, Capillaries, and Veins. Beside supplying nourishment to all parts of the body to enable them to do their work properly, it takes away material which, if allowed to remain, would cause harm.

The blood is driven through the tubes by an organ called the Heart.

The blood is carried away from the heart by the Arteries, which spread out all over the body, like the branches of a tree, becoming gradually smaller and smaller, until they form a network of very small tubes,

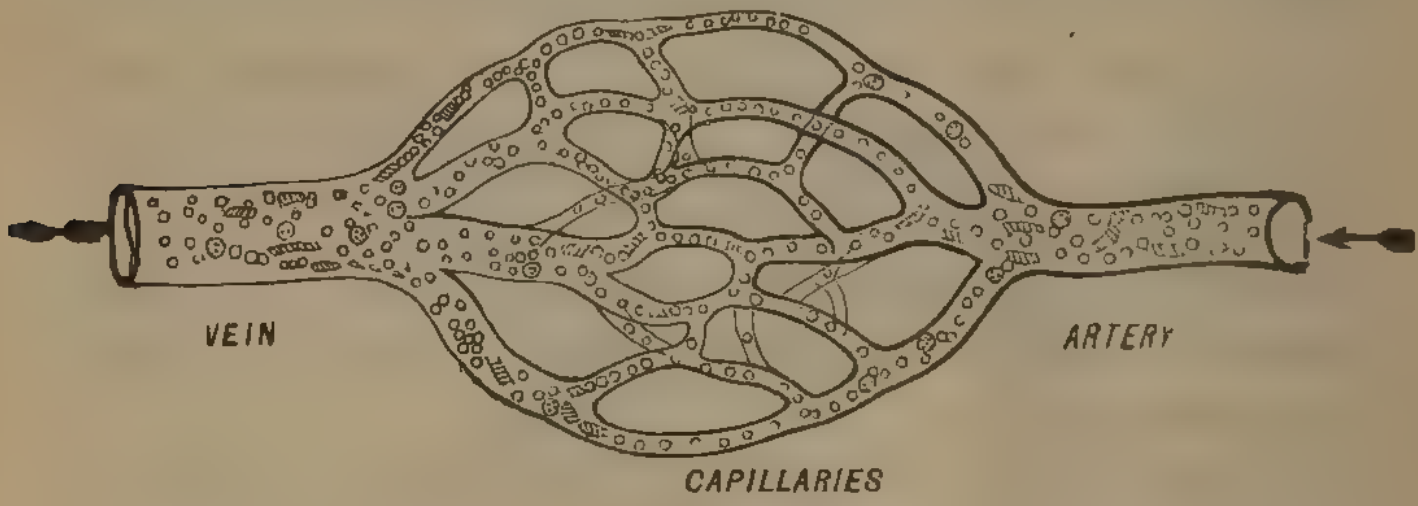


Fig. 6.

called Capillaries, which enter into the deepest parts of the different organs (Fig. 6).

The Capillaries re-unite and run into the smaller Veins, these gradually re-join, and form larger ones, which convey the blood back to the heart. When the blood reaches the Veins it is in an impure condition, as while it is passing through the Capillaries it gives up its good qualities, chiefly oxygen, and picks up any waste material, chiefly carbonic acid, which may be there.

The Heart is a hollow muscular organ of a conical shape, which lies in the middle of the chest, behind the

breast-bone, chiefly on the left side. The base looks upwards and backwards, and the point extends to just below and inside the left nipple, where it can be felt beating.

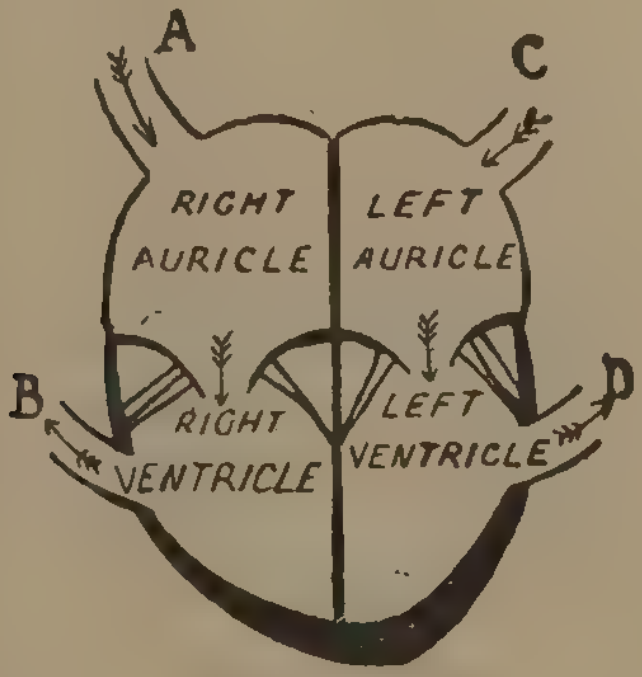


Fig. 7.

The above diagram (Fig. 7) will give a rough idea of the internal arrangements of the heart. A. Impure blood from body entering heart. B. Impure blood passing through Pulmonary Artery to lungs. C. Pure blood from the lungs returning to heart through Pulmonary Veins. D. Pure blood passing through Aorta to body.

Running from the base to the apex is a partition dividing the interior into two portions : these are subdivided into two others by means of flaps or valves.

The upper cavities are called the Auricles, and the lower the Ventricles.

In the right auricle there are two openings, by which the impure blood enters—by the upper one from the veins of the head and upper extremities, and by the lower one from those of the lower parts of the body.

As soon as the right auricle is full of blood, its walls close and force the blood through the valve into the right ventricle; when this is full, its walls close and force the blood through the Pulmonary Artery into the lungs. The blood returns from the lungs through the Pulmonary Veins into the left auricle; thence it passes into the left ventricle, which forces it into the Aorta, the large artery which begins at the back of the left ventricle, and through which it passes into the smaller arteries, which convey it over the system.

The left ventricle has the thickest and strongest walls of any of the cavities of the heart, as it has to drive the blood over the whole body.

The blood is prevented from returning into the auricles from the ventricles by valves which are attached to the sides of the walls of the heart; the free edges of the valves are attached to the walls of the ventricle by strong threads of fibrous tissue, which are only just long enough to allow them to meet, and so to shut off the two cavities.

Both auricles act together, and then the ventricles,

causing the double sound that is heard over the region of the heart. The pulsation which is felt in the arteries is caused by the action of the ventricle, driving a fresh supply of blood against that which is already in the Aorta: the pulsation is only felt in the arteries, as the blood loses its force while passing through the capillaries; when it reaches the veins it flows in a steady stream.

The blood in the Arteries and on the left side of the heart is always pure, except in the Pulmonary Artery, which conveys the impure blood from the heart to the lungs—while in the Veins and on the right side of the heart it is impure, except in the Pulmonary Veins, which bring the pure blood back to the heart from the lungs.

ORGANS OF RESPIRATION.

One of the chief impurities taken up by the blood in its passage round the body is a gas called Carbonic Acid. If this be allowed to remain in the blood, it will soon cause suffocation. To get rid of it, the blood passes through the Lungs. The process by which this purification is completed is called Respiration, and is divided into two stages—viz., Inspiration and Expiration.

The Lungs (Fig. 8) are two large bodies, which, with the heart, fill the cavity of the thorax, or chest. They rest upon an arched muscle, called the Diaphragm, or midriff, which divides the thorax from the abdomen.

The Trachea, or wind-pipe, is a flexible tube, and runs down the front of the neck from the root of the tongue to the top of the breast-bone, where it divides

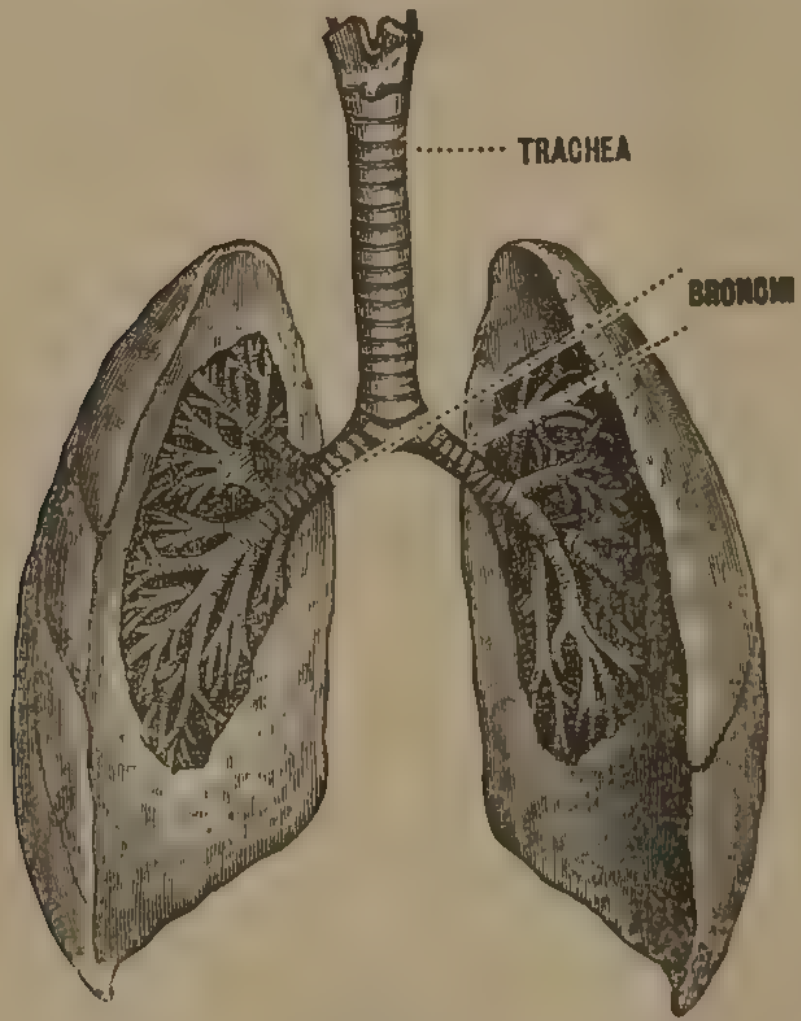


Fig. 8.

into two branches, one running to the right, the other to the left ; these again divide and sub-divide until they form very small closed tubes. Before they terminate, the tubes bulge out (as in Fig. 9), forming air-cells. The

lung is made up of these cells, covered by a network of capillaries, formed by the breaking up of the pulmonary arteries.

Inspiration is the act of filling the lungs with air. It is performed by the contraction of the muscles, which raise the ribs, thus drawing them upwards. This increases the depth of the thorax from the breast-bone to

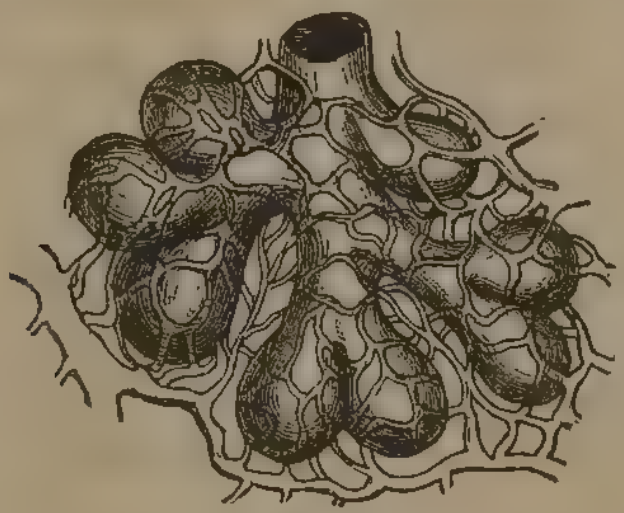


Fig. 9.

the spine. At the same time the Diaphragm acts, and becomes straight instead of curved, thus increasing the depth of the thorax from above downwards; the air then rushes in through the trachea and fills the air-cells.

Expiration, or emptying the lungs of air, is caused by the muscles relaxing, and allowing the ribs by their elasticity to fall, and by the diaphragm resuming its arched position.

While passing through the capillaries round the

air-cells, the blood is brought into close relation with the air in them. The air contains a gas called Oxygen, which is taken up by the blood, while the Carbonic Acid passes from the blood into the air-cells, thus rendering the air in them impure. At the next expiration this impure air is forced out of the lungs, and a supply of pure air is taken in at the next inspiration.

To enable respiration to be carried on properly, a good supply of pure air is necessary, and this can only be obtained by proper ventilation.

NERVOUS SYSTEM.

The whole of the processes carried on by the different parts of the body are regulated by the nervous system, which comprises the Brain and Spinal Cord: from these two organs white, thread-like bodies, called Nerves, pass off.

These are divided into the Sensory, Motor, and Sympathetic, and those composed of both sensory and motor fibres. The first kind convey sensation to the brain; the second carry orders from the brain and cause the different muscles to act. The Sympathetic, which are quite beyond our control, regulate the supply of blood to the different organs, and control certain involuntary muscles, and various functions such as digestion, circulation, and respiration.

Chapter II.

HÆMORRHAGE.

Hæmorrhage, or bleeding, is caused by the rupture of a blood-vessel, and may be either Arterial, Venous, or Capillary.

Capillary bleeding is usually caused by a scratch or graze, and very little blood is lost. Sometimes there is merely a slight oozing of a red sticky fluid from the place. It is stopped by bathing the part in cold water, and placing a pad of lint, or linen rag dipped in water, on the wound, and keeping it there by a triangular bandage.

Venous bleeding is of more importance than the last. It is known by the blood being of a dark red colour, and welling up from the wound. A pad of lint dipped in cold water should be applied at once to the wound, and tied on by a bandage ; but if this is not enough to stop it, a bandage must be applied round the limb on the side of the wound away from the heart.

The limb must be raised, and not allowed to hang down.

A very serious case of venous bleeding occurs when a varicose vein in the leg bursts, and this must be treated as above, the patient being placed on a sofa or bed, with the leg raised, and garters, straps, etc., round the knee loosened.

In bleeding from the nose, the patient should be placed on a chair or sofa, with the head raised, and ice or cold water applied to the forehead and nose.

In vomiting of blood, either from the lungs or stomach, keep the patient perfectly quiet, and give him pieces of ice to suck.

Arterial bleeding is the most important, because, unless it is soon stopped, the patient may bleed to death, as the blood always escapes with great force. It is of a bright red colour, and spurts up from the wound with a jerky jet.

To stop it, pressure must be applied at once to the wound, by the thumb or fingers, which may later be replaced by a firm pad and bandage, and if the bleeding continue, the main artery supplying blood to the part must be compressed. This must be done in some part of its course where it passes over a bone, *and as near the wound as possible.* The pressure should not be enough to cause the patient severe pain, but just sufficient to stop the stream of blood.

Pressure may be applied either by the fingers or by a tourniquet, a very useful form of which may be made

Fig. 10.

by tying a knot in the middle of a triangular bandage as in Fig. 10.

The knot is placed on the artery, and the ends are tied round the limb to keep it in its place. If a thin handkerchief or piece of cloth be used, something solid should be placed inside the knot. If the pressure be not enough to stop the bleeding, pass a stick under the bandage, and twist it round until sufficiently tight. The

Fig. 11.

stick must then be secured to the limb by a second bandage or a piece of string to prevent it slipping. By this means a patient may be left safe from further hæmorrhage. An elastic bandage or piece of india-rubber tubing, applied tightly round the limb, makes a useful tourniquet.

In arterial bleeding from the palm, a pad of some

firm material should be placed on the wound, and the fingers closed upon it, and a triangular bandage tied round the fist, and the fore-arm slung in a large arm sling.

If the wound be between the elbow and the wrist, and bleeding continue after direct pressure has been applied, a pad must be placed in the fold of the elbow, and the fore-arm bent up and tied firmly to the arm. This pad may be made by taking up a fold of the sleeve of the coat or jacket just in front of the elbow.

Fig. 12.

If the wound be above the elbow, the Brachial artery must be compressed. This artery is always to be found in a groove on the inside of the arm, between the bone and the biceps, the large muscle which lies on the front of the arm. Its course is well indicated by the inner seam of the sleeve of a man's coat, if the arm be extended with the palm uppermost the seam lies almost directly over the artery. The artery may be compressed either by standing at the side of the patient and grasping the arm underneath (as in Fig. 11), or

by standing in front of the patient and allowing his arm to rest in your palm, and pressing the artery with the thumb. This artery must always be pressed from above down to the bone, and never be grasped from above; because in the latter case it might be pressed

FIG. 13.

against soft muscle, and the bleeding might continue. Care must be taken to place the end joint of the fingers on the artery ; if the extreme end of fingers be used, severe pain will be caused by the nails running into the patient's flesh. This artery may be stopped by a tourniquet applied as in Fig. 12.

If the wound be in the armpit, a firm pad must be pressed into the armpit and the arm bound down to the side; if this be insufficient to stop the bleeding, the Subclavian artery must be compressed. The Subclavian artery is found behind the inner bend of the collar-bone, lying on the first rib. The hand must be placed on the patient's shoulder, and the thumb pressed firmly down

Fig. 14.

into this hollow, as shown in Fig. 13. If the patient be wounded on the right side, the attendant must use his left hand to compress the artery, and if on the left, his right.

In arterial bleeding about the head, pressure should be applied immediately over the wound, as the artery would be compressed against the skull.

In arterial bleeding from wounds on the face, if the

wound be over a bone pressure must be applied immediately over it ; but if it be on the cheek the forefinger should be placed in the patient's mouth, and his cheek compressed between it and the thumb.

If there be severe arterial bleeding from the lips pressure should be applied on both sides of the wound, by means of the thumbs and forefingers.

In wounds of the Temporal artery, which runs up the side of the forehead, a compress may be applied, as in Fig. 14. A pad is placed upon the wound, and kept in position by means of a bandage passed round the head and tied over the pad ; the ends are then carried over the head and under the chin, and tied on the opposite side to the wound.

In wounds of the Carotid artery the bleeding must be stopped by putting the fingers into the wound and pressing the artery against the spine. Care must be taken not to press the windpipe of the patient.

Wounds, with arterial bleeding, in the lower extremity are treated in the same way as those in the upper.

If the foot or leg be injured, pressure must first be applied directly over the wound ; and if the bleeding continue, a pad must be placed behind the knee, and the leg bent back and tied to the thigh.

If the bleeding be above the knee, the Femoral artery must be compressed. This artery commences at the middle of the fold of the groin, and runs downwards

towards the inner side of the thigh. About one-third of the way down it dips under the muscles, and cannot be felt again till it comes behind the knee. Pressure is applied either by placing the thumb in the groin and pressing the artery against the front of the haunch-bone

Fig. 15.

(Fig. 15), or by a knotted triangular bandage or a tourniquet applied tightly over the artery lower down the limb (Fig. 15).

The plan of trying to stop bleeding with tobacco must never be used, as there is great danger of the patient becoming poisoned.

As soon as the stream of blood has been stopped, the wound must be treated as an ordinary wound, but the pressure must not be removed till the arrival of a medical man.

Chapter III.
FRACTURES.

A BONE may be broken either by direct violence, by which is meant a blow falling directly on to the bone, or by indirect violence, where the bone is broken by being squeezed between two points, as when the collar-bone is broken by a fall upon the hand or by a fall or blow on shoulder, or the ribs broken by a patient being crushed in a crowd, or between a cart and a wall.

The kinds of fractures most likely to be met with are :—

SIMPLE :—Where the bone only is broken.

COMPOUND :—Where the bone is broken and a wound through the skin leads down to its broken ends. This wound may be caused either by the injury which caused the fracture, or by the broken bone being driven through the skin by improper handling of the part after the accident, such as placing a person with a fractured thigh in a cab or carriage before applying splints.

COMMINUTED :—Where the bone is broken into several pieces.

COMPLICATED :—Where the bone is broken and some of the surrounding parts injured, as when the ribs are driven into the lungs or liver, or when an artery or vein is injured by the broken bone.

Before attempting to move a patient from the place

of accident the part must be secured by something firm, which will prevent the broken bone from moving.

Signs of Fracture.

1. There is diminished power in the limb or part.

2. There are pain and swelling at the seat of the injury.

3. If the injured limb be compared with the sound one, some distortion will be noticed, it being usually shorter, or lying in some unnatural position.

4. If the limb be gently pulled it will regain its natural shape, but will return to the distorted position as soon as the traction ceases.

5. If the limb be gently moved it will be found to move somewhere in the shaft of the bone, instead of at the joint only; at the same time, a grating sensation (*crepitus*) may be felt.

6. If the bone be near the skin, some irregularity will be felt in passing the finger along it.

In examining the part, care must be taken to handle it very gently, as a great deal of harm may be done by rough usage; if crepitus be not felt when moving the bone gently, on no account move the fracture more roughly to get it. If in doubt, treat as a fracture.

If the accident occur in the open air, the clothes should be left on, as they keep the part warm, and serve as padding for the splints.

A Dislocation is the displacement of the bones forming a joint.

It is known from a fracture by the following—

1. The injury always occurs at a joint;

2. The limb is firmly fixed instead of being unnaturally movable;

3. Gentle pulling will not bring the limb into its natural position;

4. There is no crepitus.

If the dislocation be in the upper extremity the limb should, if possible, be supported by a sling; if in the lower extremity place the patient in the most comfortable position and send for medical aid.

No one but a medical man should attempt to reduce or replace a dislocation, as this operation requires a very great amount of technical knowledge.

SPECIAL FRACTURES.

FRACTURE OF SKULL.

Signs.—If the base of the skull be fractured, there will be bleeding from the mouth, nose, or ears; probably a discharge of a sticky bloody fluid from the ears. The patient will probably be unconscious.

In most fractures of the roof of the skull the patient will probably be unconscious. Possibly it will be a compound fracture, in which case the bone may be seen.

Treatment.—Place the patient on a sofa or a bed,

slightly raise the head, and keep him perfectly quiet until the doctor arrives.

FRACTURE OF THE JAW.

The patient will be unable to speak properly ; the mouth will remain open, as the jaw will drop.

Fig. 16.

If the finger be passed over the teeth and along the outside of the jaw, a depression will be felt, and probably the rough edge of the bone. The gums may be bleeding.

Treatment.—Gently raise the jaw to its natural position, and apply a narrow triangular bandage by carrying it round the jaw and over the head, cross the ends above one ear and carry them round the head and tie on the opposite side.

FRACTURE OF COLLAR-BONE.

The patient will probably be seen holding the elbow of the injured side with his sound hand : his head will be inclined towards the injured side.

If the finger be passed along the collar-bone, a depression and sharp edge may be felt, as if the bone were coming through the skin.

The patient will be unable to raise the arm above the shoulder.

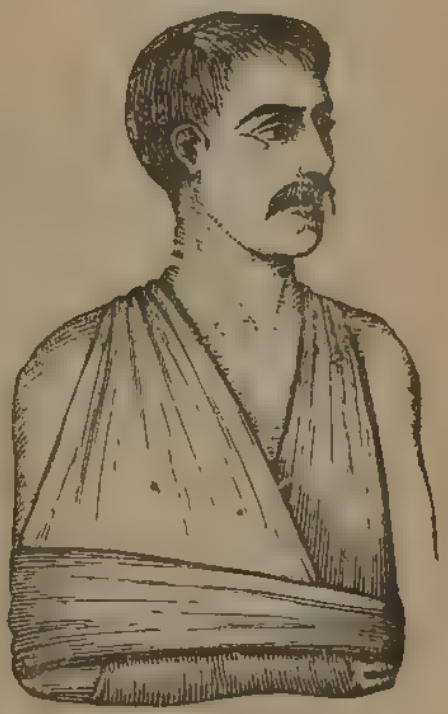


Fig. 17.

Treatment.—Place a pad of some firm material, such as a triangular bandage or handkerchief rolled tightly, in the armpit; raise the arm gently, and sling it with the large arm-sling, then tie the arm to the side by a broad bandage, passing round the arm and chest outside the sling.

The bandage binding the arm to the side must always be placed as near the elbow as possible, as the arm is to act as a lever to draw out the outer end of the fractured bone (Fig. 17).

FRACTURE OF THE ARM-BONE.

Signs.—The usual signs of a fracture.

Treatment.—This fracture may be put up in two, three, or four splints ; these must be placed—

If two be used, one inside the arm and the second outside ;

If three, one inside, one outside, and one at the back ;

If four, one inside, one outside, one in front, and one at the back. The splints must be kept in position by two triangular bandages—one tied on each side of the fracture, securing the upper bandage first.

The arm must then be slung in the small arm-sling, so that the weight of the fore-arm at the elbow may draw the fragments into position. Straw envelopes of bottles, or an expanding flower-pot ornament, may be used for this fracture, as they can be easily adapted to the part.

FRACTURE OF THE FORE-ARM.

Signs.—If both bones be broken, the usual signs of fracture will be present ; but if only one be broken, the signs will be loss of power in the limb, a depression felt at the seat of fracture, great pain at the same point.

The treatment will be the same in either case.

Treatment.—Bend the fore-arm, keeping the thumb upwards ; then apply two splints, one on the inside or

front of the fore-arm, the other on the outside or back. The inner one should extend from the bend of the elbow to the tips of the fingers ; the outer should extend from the elbow to below the wrist. Tie the splints to the arm by a bandage on each side of the fracture, secure the upper bandage or that nearest the elbow first, then sling the fore-arm in a large sling.

FRACTURE OF FINGERS.

Signs.—Usual signs of fracture.

Treatment.—Place a well-padded narrow splint under the finger, and keep it in position by a narrow bandage of linen, and sling the hand and arm in a large arm sling. If several fingers be broken, place a piece of wood, well padded, under the hand, and keep it in place by the hand-bandage, then sling the hand and arm in the large arm sling.

FRACTURE OF RIBS.

Signs.—Patient will complain of a sharp cutting pain on taking a deep breath or coughing ; he will keep his hand firmly pressed on the injured part to prevent the side moving ; he will breathe in a short, jerky manner. If the hand be placed over the seat of pain, a grating may be felt when the patient breathes ; the ends of the broken bones may be felt.

Treatment.—Tie two broad triangular bandages firmly round the chest, making the lower part of one and the upper part of the other cover the seat of pain.

FRACTURE OF THE THIGH.

Signs.—Usual signs of fracture.

Treatment.—Place a long splint on the outside of the body, extending from the armpit to the foot. This

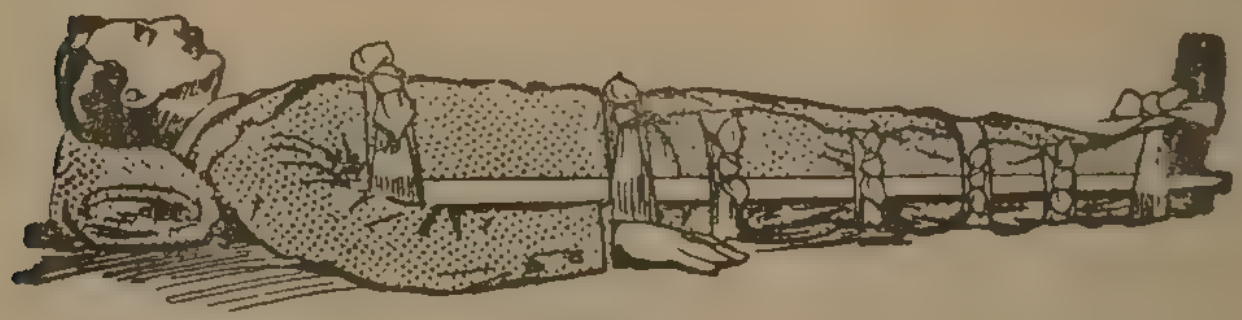


Fig. 18.

must be tied firmly to the body by a bandage passing round the chest; another round the pelvis: one above and one below the fracture; one or two below the knees; and the legs must then be firmly tied together (Fig. 18). The upper bandage must be placed round the patient's chest, for if tied over his stomach it may cause him to be sick, and it will not keep the splint firm.

Where it is suspected that this injury has occurred to a woman, tie both legs together, and apply a long splint outside the clothes on the injured side.

For this fracture any of the following things will serve as splints :—Broom-handle, two billiard cues, the top of one being tied to the handle of the other ; any long strong strip of wood. A rifle makes a good splint, the butt end being placed under the arm and the barrel extending down the leg ; or the patient may be tied on to a shutter or a long piece of wood, either of which

Fig. 19.

must be carefully pushed under the two thighs and tied to them by bandages. If nothing suitable for a splint be at hand, tie the two legs firmly together.

A useful splint for the thigh or leg may be made by rolling a pole in a piece of cloth or flannel ; the free end of the cloth is passed under the limb, and the pole is placed close up to it, and the limb then covered with the cloth ; bandages are then applied to keep the pole in position.

The sleeve of a coat may be turned inside out, and filled with paper, straw, twigs, or anything firm, and the coat applied in the same way as the cloth and pole (Fig. 19).

For children, walking-sticks and umbrellas are useful.

FRACTURE OF THE LEG.

Signs.—If both bones be broken, the usual signs of fracture will be found ; if the shin-bone only be broken, the fracture will easily be detected by passing the hand

Fig. 20.

gently down the leg, when the rough ends of the bone will be felt.

If the brooch-bone only be broken, there will be inability to use the limb, and great pain and swelling. Treat either case in the same way.

Treatment.—Apply one splint on the outside of the leg, and another on the inside ; tie them firmly to the limb, and then tie the legs together by two bandages (Fig. 20).

FRACTURE OF KNEE-CAP.

Signs.—Broken bone may be felt under the skin. Patient will be unable to raise the leg, which may be bent backwards.

Treatment.—Tie the leg on a splint extending from the buttocks to the heel, and raise the limb.

FRACTURE OF SPINE.

Usually caused by fall while hunting, or by heavy weight falling upon patient's back.

Signs.—The patient will probably be unable to move ; if the injury be very severe, he will lose all power and feeling in both the lower extremities.

Treatment.—Remove the patient as soon as possible to the nearest house, being careful not to sit him up, but to carry him perfectly flat on a stretcher.

For treating a fracture, almost any substance which is strong enough to keep the limbs at rest may be used for temporary splints. Some of the following articles can almost always be obtained, and can be easily adapted, viz., a sword and scabbard, policeman's truncheon and cape, a stocking filled with earth (Fig. 21), sand, moss, hay, chaff, or paper, and tied just above the ankle and at the top ; pieces of wood, hammers, rulers, rolls of paper or newspapers, straw cases of wine-bottles, expanding ornaments for flower-pots, long thin books, strips of cardboard, walking-sticks, and umbrellas.

If any hard substance be used, care must be taken to pad it with some soft material, especially if it has to be kept on the limb for some time.

The splints must be securely fastened to the limb by

Fig. 21.

bandages placed on either side of the fracture; the splints should, where possible, extend beyond the joints on both sides of the fracture.

If no triangular bandages be at hand, the splints can be secured by handkerchiefs, neckties, boot-laces, string, strips of cloth or calico, straps, &c. In all cases the

limb must be placed in as natural a position as possible before the splints are applied.

Never attempt to carry a patient any distance until the fractured limb has been secured in splints, or supported in some way to prevent the bones moving.

If it be not necessary to move the patient from the place of accident, make him as comfortable as possible with pillows, &c., until the arrival of a medical man.

In fractures complicated with arterial or venous bleeding, the blood must first be stopped and the fracture then attended to.

SPRAINS must always be treated by keeping the part as quiet as possible. If the joint can be covered, a triangular bandage may be firmly bound round it.

If the sprain be a very severe one, the part may be placed in a splint, and the patient carried at once to a doctor.

WOUNDS, CUTS, &c.

Before dressing any wound it should be cleansed from any foreign matter by being washed with some clean water. The parts should then be drawn together into their natural position, and kept there with strips of sticking-plaster. A pad of lint or soft linen rag dipped in clean cold water should then be applied, and kept on the wound by a triangular bandage.

Chapter IV.

INSENSIBILITY.

A very common symptom of sudden illness or accident is insensibility, which is caused by the action the brain, heart, or lungs being interfered with, and which lasts for a longer or shorter period, according to the extent of the injury.

It is necessary to try and find out the cause of the insensibility before trying to restore the patient.

The first thing to do to an insensible person is to loosen the clothes round the throat and chest, particularly any belts or braces ; then pass the hand quickly over the body, beginning at the head, to find if there be any fracture, or wound from which blood is flowing. If either of these injuries be found, it must be attended to at once ; but if not, the patient must be carefully carried into a house and placed upon a bed or sofa, and kept perfectly quiet, with head rather low. It is not always easy to discover the cause of insensibility ; so in all cases of doubt the patient must be kept very quiet till he arrival of the medical man.

APOPLEXY.

Signs.—Patient becomes suddenly insensible, breathing very laboured, and accompanied by a snoring noise ; the cheeks may be puffed out with each expiration.

The pupils of the eyes will probably be unequal.

If the arms be raised, one may give some evidence of feeling, while the other will fall helplessly to the side.

The patient cannot be roused.

Treatment.—Place the patient on a bed or sofa, with the head slightly raised. Loosen clothing round neck. Apply hot bottles or flannels to the feet and legs, and cold water applications to head.

Do not attempt to give him any stimulants, emetics or anything by the mouth.

EPILEPSY, OR FALLING SICKNESS.

Signs.—The patient is suddenly seized with the fit, frequently uttering a piercing scream before becoming unconscious, and falls.

The hands are tightly clenched, the legs and arms being jerked violently towards the body.

The face becomes livid, and a froth, sometimes streaked with blood, appears round the mouth.

After a few minutes the convulsions cease, and the patient either gets up and walks away or drops off into a deep sleep.

Treatment.—If about to fall, catch him from behind by placing your hands under his arm-pits. If on the ground, push away anything against which he may hurt himself, such as chairs, &c. ; or drag him away from a wall, or heavy piece of furniture. Put your own left arm under his head, while you kneel at his head, and

with your right hand undo his collar, &c. Push a piece of wood, or some hard substance rolled in a handkerchief, between his teeth. Do not try to restrain his movements at all.

If he wish to go to sleep after the fit, do not prevent him, but do not leave him by himself for several hours.

CONCUSSION OF THE BRAIN.

Produced by blows on the head, or from falling on the feet from a great height. It is either severe or slight.

SLIGHT CONCUSSION.

Signs.—Patient will be very pale, breathing very slowly, lying with the eyes shut.

If spoken to, will rouse himself as if from sleep and answer properly ; then will relapse into the partially insensible state.

After a few minutes he will probably vomit, and then gradually recover.

Treatment.—Place the patient on a sofa ; apply warm bottles and flannels to his feet and hands, and let him keep quiet for a short time.

One form of concussion frequently met with occurs in young children. While playing, they tumble and strike the head.

Most of the symptoms mentioned above then appear.

The best thing to do in this case is to keep the child

very quiet, and allow him to go to sleep, and not to rouse him, as many parents try to do.

SEVERE CASES.—In these the substance of the brain is bruised, and the symptoms are like those of apoplexy, and the case must be treated as such.

FAINTING is due to failure of the heart's action, and is usually caused by fright, hunger, heat, excessive fatigue, hæmorrhage, &c.

Signs.—The patient suddenly becomes pale; if standing, he staggers; if sitting down, he is restless and uneasy for a minute or two; a clammy sweat breaks out over the forehead and under the eyes; the respiration becomes hurried and shallow, and he then loses consciousness.

Treatment.—If occurring in a church or crowded room, the patient's head should be pressed down below his knees, and kept there for a few minutes. After this, he is usually sufficiently recovered to walk out of the room.

The clothes round the neck and chest should then be undone, and the face and hands bathed in cold water. A stimulant—as sal-volatile, tea, coffee, or wine—may then be given. Another plan is to place the patient flat on the floor, with the head on a level with the body.

If the fainting be due to loss of blood, the wound from which the blood is coming must be dressed, and the blood stopped, and some stimulant given.

If due to hunger or excessive fatigue, care must be taken not to give too much food at once. Warm milk, beef tea, wine and water, may be given in small quantities very frequently; and as soon as the patient feels able to sit up and eat, something solid may be given.

ALCOHOLIC POISONING (DRUNKENNESS).

Signs.—Patient is helpless, both sides being equally useless; face usually flushed, but may be pale, pupils usually dilated, but sometimes contracted; skin is cold and clammy.

If the patient be questioned, he will answer in an incoherent manner. There is usually a strong odour of alcohol about breath.

Treatment.—If told that the patient has been drinking very freely within a few hours, give an emetic of a tablespoonful of salt in a tumbler of warm water, or one teaspoonful of mustard in the same quantity of warm water. If this emetic be ineffectual it may be repeated at intervals of ten minutes. After this has operated, the patient may be allowed to go to sleep. *Unless perfectly sure that the patient is intoxicated, do not give the emetic.*

If the weather be very cold, care must be taken to keep the patient warm, as a drunken person is very susceptible to cold.

If the drinking bout has been a prolonged one, the

patient must be kept quiet and warm till the arrival of a doctor. A cup of hot tea or coffee is the best stimulant to give the patient.

OPIUM (LAUDANUM) POISONING.

Signs.—Before the opium has taken full effect the face may have a flushed appearance; breathing very deep and slow; *pupils contracted;* patient is very drowsy, but he can be roused by shouting at him.

If the patient get worse, his breathing becomes very slow and quiet; face pale, and the pupils contracted to size of pins' heads; when in this state he can be roused only with the greatest trouble.

Treatment.—Give patient an emetic, and do not allow him to give way to the great desire for sleep.

He should be supported by two attendants, and kept walking up and down.

Strong coffee should be given frequently.

HYSTERICAL FITS

Usually occur in females; come on suddenly, in consequence of some excitement.

Signs.—Patient falls down (usually in some comfortable place); clenches her hands; grinds her teeth.

The eyelids are partially closed, the eye being turned upwards. Patient alternately cries and laughs.

Treatment.—Be firm with the patient, and tell her

that if the fit continue you must drench her with cold water.

Send every one out of the room except one friend, and keep the patient very quiet.

Chapter V.

WOUNDS, Etc.

BITES OF ANIMALS.

If the animal inflicting the wound be healthy, the bite should be carefully washed, and dressed with cold-water dressing.

If the animal be rabid, more severe methods must be used. A ligature should at once be placed round the limb between the wound and the heart, to prevent the poison being carried all over the body. The wound should then be well washed with water, or put under the tap, and where possible the patient should suck the wound, unless he have a fresh crack in his lips; after this it must be burnt with some strong acid, as nitric or sulphuric acid, or lunar caustic, care being taken that every part of the wound is thoroughly burned.

If the accident occur in the open, gunpowder may be placed in the wound and fired, this being done once or twice; or the wound may be burnt several times by ordinary fusees.

If the patient become faint, some stimulant, as brandy or wine, must be given.

ADDER AND SNAKE BITES.

Patient will feel a sharp stabbing pain at seat of bite. After a short time he will feel faint and sick, and his face will become very pale.

The part bitten will swell and feel very stiff.

Treatment.—Apply a drop or two of strong ammonia to the bite, and tie a ligature between the wound and heart. Give patient some brandy or whisky and water.

A snake bite would be best treated by the instructions given above for bites of rabid animals.

Stings of insects, bees, wasps, scorpions, &c. These should be treated in the same way as adder bites.

BURNS AND SCALDS.

A burn is caused by dry heat, and a scald by moist the effect upon the body being the same. The point of the treatment is to exclude the air as quickly as possible. This may be done by dredging the part thickly with flour, provided the skin is unbroken, and not disturbing it for some time.

Any vegetable oil—such as salad, sweet, or linseed—may be applied, by soaking a piece of rag in it and covering the wound.

A very good application is made by mixing equal parts of linseed oil and lime water, forming "carron oil."

The plan that is very popular of holding a burn in front of a fire must never be adopted ; it is simply increasing the injury.

The clothing must be removed very carefully ; but if it firmly adhere, oil should be poured over it, or cut round it with scissors. Have everything ready to apply before removing the clothes.

When any person's dress catches fire the advice of Professor John Marshall should be followed, viz. :—If the dress of a woman catch fire, she should at once lie down on the floor, and should crawl in this position either to a bell-pull or door, and call for assistance ; or she should roll herself in a rug or blanket. In the event of a man rendering help, he should at once lay the patient down, take off his coat and roll her in it, unless he can obtain a blanket or rug, or roll her on the carpet ; if a woman render assistance, she must be careful not to allow her own clothing to touch the patient, but to hold a rug or blanket in front of herself while approaching the flames.

FROSTBITE.

Patient will have been exposed to very severe cold. The part affected will be altered in colour, assuming the greyish white hue of tallow, or it may have a dark purple look. The patient does not complain of affected part feeling cold, as local sensation is abolished.

Treatment.—Take care not to bring the patient into the warmth at once, but use friction over the affected parts till sensation returns.

SUNSTROKE

Comes on when the patient has been greatly fatigued or undergoing great exertion when exposed to a high temperature. The patient may either fall suddenly or complain of throbbing in the head with feeling of faintness and sickness.

Treatment.—He should be removed to a cool place, and ice applied to his head or bathed freely with cold water. All tight clothes are to be removed, and stimulants to be avoided.

POISONING BY ALKALIES.

A person swallowing caustic soda, caustic potash, or any strong alkali, would experience a very strong caustic taste, with a burning feeling extending from the throat to the stomach. The mouth will look inflamed and of a deep red colour, with pieces of the lining membrane hanging down.

Treatment.—Make the patient wash his mouth out with vinegar, lemon-juice, or tartaric acid, well diluted with water, then give oil, white of eggs, milk, or gum water.

POISONING BY ACIDS.

A person swallowing a dose of strong acid, such as

Sulphuric (*Oil of Vitriol*), Nitric (*Aqua Fortis*), or Hydrochloric (*Spirit of Salt*), will immediately complain of an intense burning pain in the mouth and throat, and great pain in swallowing.

The mouth will look swollen, and covered with a white skin.

Treatment.—Make the patient wash the mouth out freely with some chalk, whiting, or magnesia, stirred up with water or milk,

After washing out the mouth freely, give the patient a little oil, barley-water, or milk to drink.

POISONING BY PHOSPHORUS.

Caused frequently by children sucking lucifer matches. The patient has a very disagreeable burning sensation in throat, intense thirst, and sometimes vomiting.

Treatment.—Give the patient an emetic, and then drinks of barley-water or magnesia and milk, but never give oil.

POISONING BY CARBOLIC ACID.

Patient will complain of a great burning sensation in the mouth, the mouth will look white and shrivelled, and there will be a strong smell of tar or carbolic acid.

Treatment.—Make patient wash out his mouth very freely with oil.

POISONING BY OXALIC ACID.

Patient will complain of a very strong acid taste

with a burning in the throat, then in the stomach; vomiting of the contents of the stomach with a quantity of blood then comes on, and the patient gradually sinks.

Treatment.—Give patient some chalk or whiting mixed in water.

In cases of poisoning by other poisons, such as Salts of Copper, Arsenic, and other minerals, and vegetable poisons, give the patient an emetic of warm water, or a tablespoonful of salt, or one teaspoonful of mustard, in a tumbler of warm water.

If he be very cold, apply heat to the extremities; and if the retching continue after the stomach has been emptied, give plain warm water or milk and water to drink. Send at once for medical aid in all cases of poisoning.

FOREIGN BODIES IN THE EYE.

If the foreign body is under the upper eyelid, seat the patient in a chair, and, standing behind him, place a match or bodkin over the lid; take hold of the eyelashes, and turn the lid upwards. Then, having exposed the substance, brush it off with the corner of a handkerchief or a camel's-hair brush. If it be under the lower eyelid, simply depress the lid, and proceed as above with handkerchief or brush.

FOREIGN BODIES IN THE EAR.

Do not attempt to remove the body by poking at it

with pins, needles, or knitting-needles, but put in a few drops of warm oil, and take the patient to a medical man.

CHAPTER VI.

ARTIFICIAL RESPIRATION.

ARTIFICIAL RESPIRATION must be employed in cases of accident or poisoning when the breathing has become very feeble or has ceased ; as in cases of hanging, drowning, suffocation from any cause, or opium poisoning.

The first thing to do in cases of suffocation is to get the patient into the fresh air, then to loosen quickly all clothing round the throat, chest, and waist, then to beat the patient on the chest with a towel dipped in cold water, to try and make him gasp, so that the lungs may be filled with fresh air ; if he shows no sign of breathing then, artificial respiration must be employed.

In cases of drowning, get the patient on to dry land or into a boat, then loosen the clothing round his neck, chest, and waist ; clear out the mouth, in case any weed or foreign matter be in it ; then roll him on to his chest for a minute, to allow any water to escape from his mouth ; then roll him on to his back, and draw the tongue forward, and keep it out by a band passing over it and under the chin. Then commence artificial respiration as described below.

Dr. Sylvester's Method.

Place the patient on his back, with a small firm cushion or rolled-up article of clothing under his

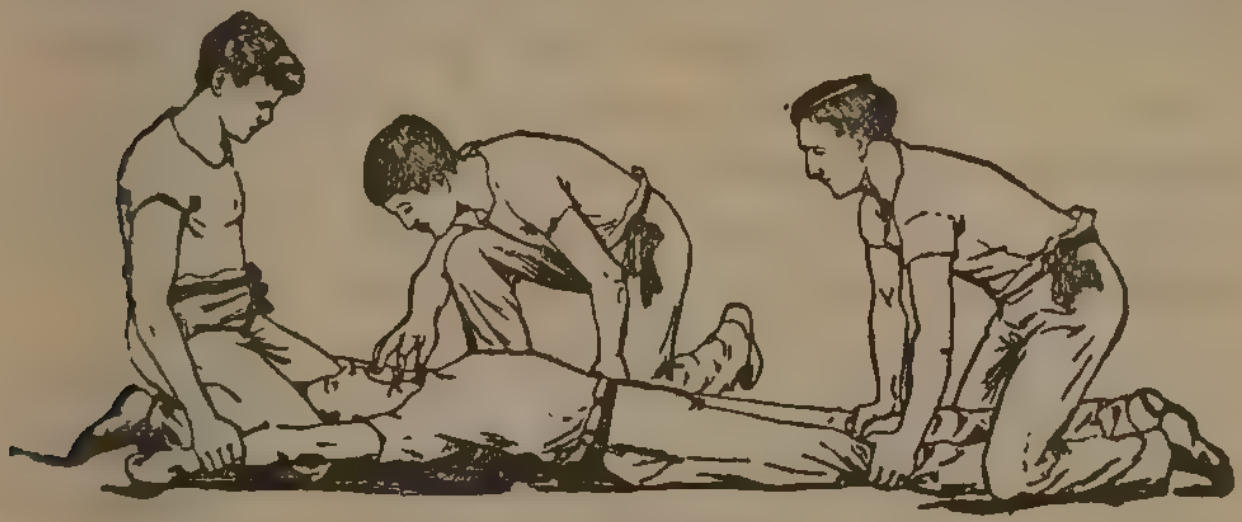


Fig. 22.—Position A.

Fig. 23.—Position B.

shoulder-blades ; kneel at the patient's head, and grasp his arms just below the elbows ; draw them gently, and with a sweeping motion above the head, and cross them ;

keep them in this position for about two seconds, then carry the arms down on to the side of the chest and press firmly for two seconds (position B); repeat these movements steadily and slowly about fifteen times a minute till breathing commence, or till a medical man pronounces life to be extinct. If the patient be a large person and the rescuer be unable to continue the movements, he can get an assistant to take one arm while he manipulates the other, but in this case both arms must be moved simultaneously.

Whilst the above operations are being employed, let a bystander dry the hands and feet, and as soon as dry clothing can be obtained strip off the wet clothing and replace it with the dry; this must be done so as not to interfere with the efforts to restore the breathing.

As soon as breathing has commenced, begin to promote the circulation by rubbing the limbs upwards with firm, grasping pressure, using warm flannel or cloths. No effort must be made to restore the circulation till the breathing be properly carried on.

The friction must be continued under the blanket or over the dry clothing.

Promote the warmth of the body by the application of hot flannels, bottles, or bladders of hot water, heated bricks, &c., to the pit of the stomach, the armpits, between the thighs, and to the soles of the feet.

If the patient has been carried to a house after

respiration is restored, be careful to let the air play freely about the room.

On the restoration of life, a teaspoonful of warm water should be given; and then, if the power of swallowing has returned, small quantities of wine, warm brandy-and-water, or coffee should be administered. The patient should be kept in bed, and a disposition to sleep encouraged.

If there be pain or difficulty in breathing, apply a hot linseed poultice over the chest.

Watch the patient carefully for some time, to see that the breathing does not fail; should any signs of failure appear, at once begin artificial respiration.

General Observations.

The above treatment should be persevered in for some hours, as it is an erroneous opinion that persons are irrecoverable because life does not soon make its appearance, persons having been restored after persevering for many hours.

Appearances which generally accompany Death.

Breathing and the heart's action cease entirely; the eyelids are generally half-closed, the pupils dilated; the tongue approaches to the under edges of the lips, and these, as well as the nostrils, are covered with a frothy mucus. Coldness and pallor of surface increase.

Cautions.

Prevent unnecessary crowding of persons round the body, especially if in an apartment.

Avoid rough usage, and do not allow the patient to remain on the back unless the tongue is pulled out.

Under no circumstances hold the patient up by the feet.

On no account place the patient in a warm bath, unless under medical direction.

STRANGULATION.

Accidental strangulation may occur from tightening of neck-ties, &c., round children's necks, or in intoxicated persons from various causes.

Treatment.—At once cut the compressing band round the throat, and commence artificial respiration if necessary, not forgetting to pull out the tongue and secure it. If in a confined space, open windows. Insist on bystanders allowing free access of air.

CHOKING.

May take place from a piece of meat being accidentally drawn into the windpipe instead of the gullet; or from hard substances, such as coins, &c., which had been placed in the mouth being accidentally swallowed. The patient starts up, attempts to put his fingers to the back of his mouth, struggles for breath, the complexion

becoming dusky. If the substance be not at once removed, he falls insensible, and respiration ceases.

Treatment—Boldly but firmly carry the thumb and forefinger to the back of the mouth, and try to hook the obstruction forward. Should this fail, the patient may be relieved were he to vomit, and this may be brought about in the following way : Lay him on his back, and putting your knee on the pit of his stomach, lean on it, and with your open hand strike him firmly on the cheek. This will cause him to try and take a deep breath, and he will vomit. If he still remain insensible after the obstruction has been removed, at once commence artificial respiration.

HANGING.

Do not waste time by going for assistance, but cut the rope at once, and if the patient do not breathe freely commence artificial respiration immediately.

POISONING BY GASES.

This may be caused by the escape of ordinary gas into a room ; by a coke or charcoal fire in a badly-ventilated room; by the accumulation of carbonic acid gas in sewers or wells ; by chloroform ; or by choke-damp in mines after explosions, &c.

Do not take a light into a room where gas is escaping. Open or break the windows before trying to drag the patient out if he be far from the door.

Signs.—Patient is insensible ; face pale ; lips livid ; the tongue livid, swollen, and perhaps protruding between the teeth. The hands are usually clenched, and the nails bluish.

Treatment.—The patient must be at once removed into the fresh air ; the clothes must be loosened round the neck and chest, the face and chest bathed with cold water.

If these means fail to produce respiration, artificial respiration must be used.

Chapter VII.

BANDAGING.

ESMARCH'S TRIANGULAR BANDAGE (Fig. 24) may be applied to any part of the body. It is made

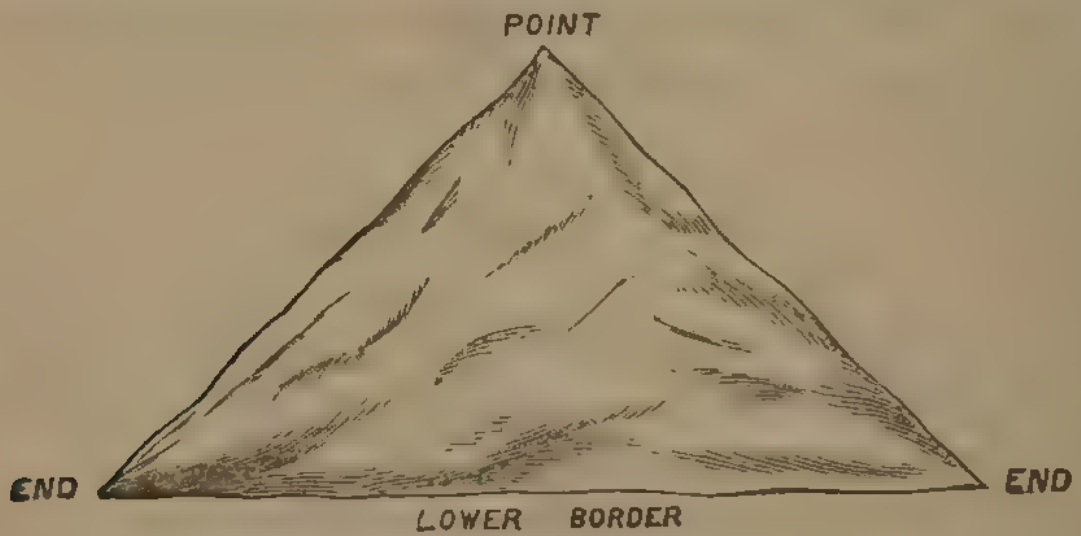


Fig. 24.

by cutting a piece of linen or calico forty inches square

into two pieces crossways. The bandage may be used either as a broad or narrow bandage.

The *broad* is made by spreading the bandage out, then bringing the point down to the lower border, and then folding into two.

The *narrow* is made by drawing the point down to the lower border, and then folding into three.

The bandage should always be fastened either by a pin or by being tied with a reef-knot (Fig. 25). It is applied to the body as follows :—

Fig. 25.

To the scalp (Fig. 26).—Fold a hem about 1½ inches deep along the lower border, place the bandage on the head so that the hem lies on the forehead and the point hangs down at the back ; then carry the two ends round the head above the ears, cross them at the back, and

bring them forward and tie on the forehead ; then draw the point downwards, and turn it up and pin it on to the top of the head.

In applying this bandage, care must be taken to put the hem close down to the eyebrows, to carry the ends

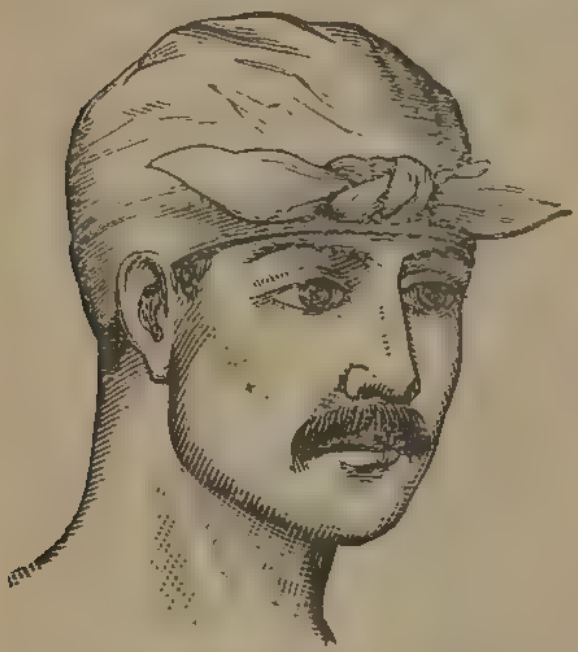


Fig. 26.—Front View.

Fig. 27. -Back View.

above, not over, the ears, and to tie them close down to the eyebrows, and not high up on the forehead.

For the *forehead, side of head, eye, cheek, for any part of the body which is round* (as the arm or thigh, &c.), the narrow bandage must be used, its centre being placed on the wound, and the ends being carried round the limb and tied over the wound.

For shoulder (Fig. 28).—Place the centre of a bandage on the injured shoulder, with the point running up the

side of the neck ; carry the ends round the middle of the arm and tie them ; take a second bandage, fold it into a broad bandage, place one end over the point of the first

Fig. 28.

bandage, sling the arm by carrying the other end of the bandage over the sound shoulder, and tying at the side of the neck ; bring the point of the first bandage under that part of the sling resting on the injured shoulder, draw it tight, turn it down, and pin it.

For hip (Fig. 29).—Tie a narrow bandage round the body above the haunch-bones, tying the knot on the same side as the injury ; take another bandage, turn up a hem according to the size of the patient, place its centre on the wound, carry the ends round the thigh, and

Fig. 29.

tie them ; then carry the point up under the waistband, turn it down over the knot, and pin it.

For the hand (Fig. 30).—Spread out a bandage, place

Fig. 30.

Fig. 31.

the wrist on the border with the fingers towards the point ; then bring the point over the wrist, pass the two ends over the wrist, cross, and tie them.

For the foot (Fig. 31).—Spread out a bandage, place

Fig. 32.

the foot on its centre with the toe towards the point ; draw up the point over the instep, bring the two ends forward, cross, and tie them either on the sole (if to keep a splint on) or round the ankle.

Large arm-sling (Fig. 32).—Spread out a bandage, put

one end over the sound shoulder, let the other hang down in front of the chest; carry the point behind the elbow

Fig. 33.

Fig. 34.

of the injured arm, and bend the arm forward over the middle of the bandage; then carry the second end over the shoulder of the injured side, and tie to the other end; bring the point forward, and pin to the front of the bandage.

Small arm-sling.—Fold the bandage into the broad bandage; then place one end over the shoulder on the sound side; cross the arm over the middle of the

bandage hanging down the chest; then bring the other end over the injured shoulder and tie at the side of the neck.

For chest (Figs. 33 and 34).—Place the middle of the bandage on the injured side, with the point over the shoulder; carry the two ends round the waist and tie them; then draw the point over the shoulder and tie to one of the ends.

For the back.—The bandage is applied as above, but beginning by placing the bandage on the back.

Chapter VIII.

CARRYING PATIENTS.

In accidents where the patient has been rendered unable to walk alone, he may be carried by the by-standers making either of the following seats:—

(1.) The four-handed is made by two persons clasping their left wrists with their right hands, then clasping each other's right wrist with their left hands (as Fig. 35).

After the hands are clasped together, the bearers stoop down behind the patient, who sits on the hands, and at the same time places one arm round the neck of each bearer.

This seat is used where the patient is sufficiently conscious to give some assistance to the bearers and is able to use his arms, but is unable to walk.

Fig. 35.

(2.) The two-handed seat is made by two bearers clasping their hands as in Fig. 36, and placing their free hands on each other's shoulder.

In case of the patient being a short person the bearers should place their hands on each other's hips instead of on the shoulders.

This seat is used when the patient is unable to give any assistance, as when the arms have been injured or the patient feels faint.

The second kind of seat may be used to lift a helpless patient from a chair to the bed.

A bearer stands on each side of the patient, and passes one arm under his knees and clasps the hand of the other bearer. The bearers then pass their arms round the back of the patient and grasp each other's shoulder.

FIG. 36.

One bearer may carry a patient by the ordinary "pick-a-back" method, or as follows :—

The bearer stoops down in front of the patient and passes his right arm between the patient's legs ; the patient then falls across the bearer's back, so that his right arm comes in front of the bearer's left arm. The patient is kept from falling by the bearer holding his right leg and right arm.

The plan of carrying the patient by the arms and legs, with the face downwards, commonly called the "frog's march," must never be used, as death may ensue from this treatment.

Where a proper stretcher cannot be obtained, a temporary one may be made in either of the following ways :—

(1.) The sleeves of a coat may be turned inside ; two stout poles are then passed through them, and the coat buttoned. This makes a good seat. (Fig. 37.)

The patient sits on it, and rests against the back of the first bearer.

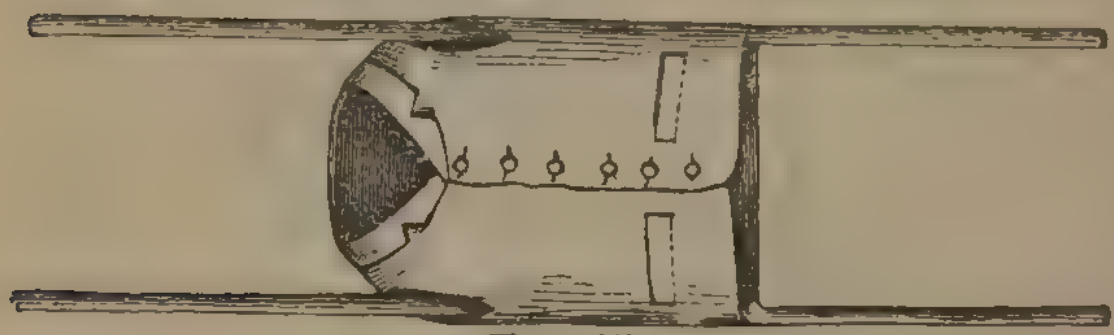


Fig. 37.

If a longer stretcher be required, two coats must be treated in the same way. (Fig. 38.)

Fig. 38.

(2.) Two sacks may be taken ; a hole is made in each corner of the bottom, and two poles passed through the sack and out of the holes. (Fig. 39.)

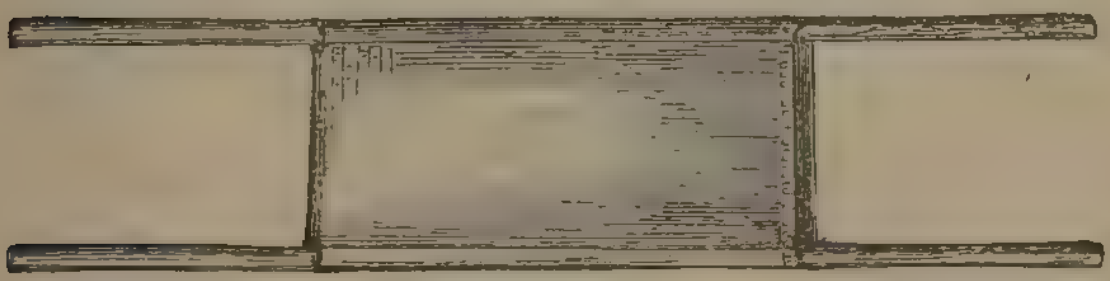


Fig. 39.

(3.) A large piece of carpet, sacking, tarpaulin, or a blanket may be spread out, and two stout poles rolled up in the sides.

Two bearers then stand on each side. They grasp the middle of the pole with one hand, and near the end with the other. To carry the patient, they must walk sideways.

(4.) A hurdle, broad piece of wood, or shutter may be

employed as a stretcher; but if either of them be used, some straw, hay, or clothing should be placed on it, and then a piece of stout cloth or sacking; the sacking is useful in taking the patient off the stretcher when he arrives at the bed-side.

Always test a temporary stretcher before placing the patient on it.

Temporary stretchers must be carried, and the patient placed on them as laid down in the "Stretcher Exercises."

Never allow stretchers to be carried on the bearers' shoulders.

Always carry patient feet foremost, except when going up a hill. In cases of fractured thigh or fractured leg, if the patient has to be carried down hill, carry the stretcher head first.

In carrying a patient on a stretcher care should be taken to avoid lifting the stretcher over walls, hedges, or ditches, but where these cannot be avoided the stretcher must be carried in the following ways:—

To Cross a Ditch.

The foot of the stretcher must be carried to about one pace from the edge of the ditch and lowered. Nos. 2 and 3 bearers must then jump into the ditch and each take hold of one of the handles, No. 1 remaining at the head of the stretcher. When all are ready the stretcher is carried forward, and the foot carried to the other side

of the ditch, and the stretcher again lowered; No. 2 then jumps out of the ditch and No. 1 jumps into it. Nos. 1 and 3 then take hold of the head of the stretcher and No. 2 the foot, and the stretcher is slowly carried till the head is placed on the other side of the ditch. Nos. 1 and 3 then jump out of the ditch and take their ordinary places.

If the ditch be a very broad one the stretcher must be brought to the side and lowered. Nos. 2 and 3 jump into the ditch and take hold of the handles and lift the stretcher till its head rests on the edge. No. 1 then jumps into the ditch, No. 3 then gives the foot to No. 2, and goes to the head with No. 1, the stretcher is then carried forward and gradually lowered to the bottom of the ditch; to lift the stretcher out of the ditch proceed as if crossing a wall.

To Cross a Wall.

The stretcher is lowered about one pace from the wall. Nos. 2 and 3 bearers then take hold of the foot of the stretcher and No. 1 the head; the stretcher is raised till the lower end is placed on the wall. No. 2 then jumps over the wall and takes hold of the foot of the stretcher while Nos. 1 and 3 support the head; the stretcher is then carried forward till the head rests on the wall, No. 2 supporting the foot. Nos. 1 and 3 then jump over the wall, and take hold of the head of the stretcher, which is then slowly lifted off the wall on to the ground, and the bearers take their usual places.

To Load a Waggon.

The stretcher is carried to within one pace of the end of the waggon and lowered. Nos. 2 and 3 take hold of the foot of the stretcher, No. 1 the head. The stretcher is then raised and carried forward till the front wheels rest on the floor of the waggon. No. 2 then jumps into the waggon, while No. 3 goes to the head of the stretcher and helps No. 1. The stretcher is then pushed slowly into the waggon. If the tail-board cannot be shut, the stretcher must be lashed firmly to the sides of the waggon.

To Unload Waggon.

Nos. 1 and 3 take hold of the head of the stretcher, while No. 2 gets into the waggon ; the stretcher is then gradually drawn out till the foot-wheels rest on the edge of the waggon. No. 2 jumps out of the waggon and with No. 3 takes hold of the foot of the stretcher, No. 1 supporting the head. The stretcher is then gently drawn away one pace from the waggon and lowered. The bearers then fall in in their usual places.

When four bearers are attending to the patient, Nos. 1 and 3 would lift the head of the stretcher, while Nos. 2 and 4 lift the foot.

Chapter IX.

CARRYING STRETCHERS.

BY MR. JOHN FURLEY.

Hitherto the instruction given to the Classes of the St. John Ambulance Association, on the removal of Sick and Injured persons by stretchers or improvised methods of transport, has been founded on Rules laid down in Professor Longmore's "Treatise on the Transport of Sick and Wounded."

But it has been amply proved that rules necessary for drilled and disciplined bodies of men, such as the Army Hospital Corps, are not applicable to those who undergo a brief training to enable them to give first aid in the accidents of civil life. In the majority of cases in which a certificated pupil is called upon to act, he has to look for assistance from men who have had no such instruction as he possesses, whereas every member of a military bearer company is drilled to work with others, and when three or four of such men have been numbered off, each knows what is expected of him.

The regular drill required for a bearer company in the army is therefore not the best for a class of pupils of this Association, except in the case of a corps which may be called on to act with a military body.

On a parade ground or in a military hospital there is generally plenty of space, and one system of lifting

and carrying invalids can be adopted, but the accidents which happen in civil life make it necessary that much should be left to the intelligence and experience of those who have to render first aid. For instance, when a patient has to be placed on a stretcher in a cottage, in a factory crowded with machinery, or in the tortuous passages of a mine, it would be quite impossible to follow the directions given in the "Manual of Exercise for Stretcher Bearers and Bearer Companies," but the stretcher must be put at the side of the patient or in any other position possible, and the bearers must act accordingly, under the direction of one of their party.

On this subject Professor Longmore has said: "The military rules were framed for service in the open air, where there is, of course, plenty of space, but all such rules must be modified according to circumstances. It is well, I think, to teach the system which is thought to be best, and at the same time to prepare persons for doing that which is next best, when what may be best under other conditions ceases to be applicable."

For purposes of drill, numbering the bearers will be found useful, whenever three or four men, thus instructed find themselves in a position to work together, they will act with less hesitation, less liability to accident, and with more speed; but it must be repeated that in nearly all ordinary accidents, an efficient bearer will have to select his assistants without previous notice, and give

them his directions as briefly and clearly as he can. The most important point is to understand the *principles* which have dictated the rules laid down in the Exercises.

N.B.—It is not pretended that the following Stretcher Exercises will be found equal to every circumstance that may arise. For instance, the placing of a stretcher in a road-cart or railway carriage must depend on the shape of the vehicle, and perhaps on the width of a door. It would occupy too much space, and then, perhaps, the directions would be found inadequate, were attempt made to suggest plans for all cases. From personal experience—and we are daily assisting in the removal of invalids by road and rail—we are satisfied that those who take the trouble to attend the lectures and qualify themselves for the certificate are fully able to meet exceptional difficulties as they arise. Instructors and pupils may, however, be reminded that whenever necessary the stretcher issued by the Association may be lessened in width without inconvenience to a patient upon it.

STRETCHER EXERCISE. No. I.

For three Bearers. To be used when space will allow.

1. The Instructor selects the Bearers and numbers them—1, 2, 3, at his discretion. Should one man be taller and stronger than the others, he should be styled

No. 1, as he will have to bear the heavier part of the burden.

All orders will be given by No. 3.*

2. "PLACE THE STRETCHER."

No. 1 taking the head of the stretcher, and No. 2 the foot, place it in a line with the Patient's body, the foot of the stretcher being close to his head.

No. 3 attends to the patient, assisted by Nos. 1 and 2 when necessary.

3. "FALL IN." At this order,

No. 1 places himself at the Patient's right side.

No. 2 at his left side, and both Bearers face each other.

No. 3 takes position on the injured side, in a line with the Patient's knees.

Note.—The duty of No. 3 will be entirely to look after the injured part of the Patient's body or limbs, to see that no bandages or splints become displaced, and also that No. 2 Bearer, in lifting or carrying, does not in any way touch the Patient's feet.

When everything has been arranged for the removal of the Patient, the order will be given—

* Bearers should be taught to take any of the positions named in the following Exercises, whether that of No. 1, 2, 3, or 4 Bearer.

4. "READY."

Nos. 1 and 2 now each sink down on one knee and grasp each other's hands under the shoulders and thighs of the Patient, whilst No. 3 places his hands underneath the lower limbs, always taking care, in case of a fracture, to have one hand on each side of the seat of injury.

5. "LIFT."

All three Bearers rise together to their feet, keeping the Patient in a horizontal position.

6. "MARCH."

All take short side-paces until the Patient's head is over the pillow of the stretcher.

7. "HALT."

All three Bearers remain steady, and wait for the next order.

8. "LOWER."

The Patient is placed gently on the stretcher, and the Bearers then stand up.

9. "FALL IN." On this order being given,

No. 1 places himself at the head of the stretcher with his face towards the Patient, No. 2 at the foot with his back to the Patient, and No. 3 places himself at the side of the Patient.

10. "READY."

Nos. 1 and 2 stoop down and grasp the handles of the stretcher, having previously adjusted their shoulder-straps in case they are used.

No. 3, as soon as he sees all is right gives the word—

11. "LIFT."

The stretcher is now raised to position ready for moving off, care being taken to keep the Patient's head above the level of his feet.

12. "MARCH." On this word being given,

No. 1 steps off with the left foot, and No. 2 with the right.

The step should be a short one of twenty inches, and taken with bent knees just from the hips.

13. "HALT."

The place of destination being reached, on the word "Halt" being given, the Bearers remain steady in position.

14. "LOWER."

At this order the Bearers place the stretcher on the ground, and then stand up ; care being taken to let the Patient's feet reach the ground before his head.

15. "UNLOAD STRETCHER—READY."

The Bearers prepare to take the Patient off the stretcher.

16. "LIFT."

The Bearers raise up the Patient as before instructed.

17. "LOWER."

The Patient is carefully lowered on to the vehicle, bed, or other place to which it has been designed to carry him.

STRETCHER EXERCISE, No. II.

For four Bearers. To be used when there is not sufficient space for carrying out Exercise No. I.

1. The Instructor numbers the Bearers—1, 2, 3, 4. All orders will be given by No. 4.

2. **"FALL IN."**

At the words "Fall in," Nos. 1, 2, and 3 take position on one side of the Patient. No. 1 places himself at the Patient's shoulder, No. 2 near the middle of the body, No. 3 near the Patient's feet. At the same time No. 4 places the stretcher on the ground by the other side of the Patient, about one pace away from him, and remains standing near its centre, facing the other Bearers.

3. **"READY."**

Nos. 1, 2, and 3 stoop down, and kneel on the left knee if they are on the left side of the Patient, on the right knee if they are on the right side of the Patient. They then proceed to take hold of the Patient:—No. 1 passing one of his arms beneath the Patient's neck and the other under his shoulder-blades; No. 2 passing both arms under the middle of his body, one above, the other below the buttocks; and No. 3 passing both arms under the lower extremities, excepting in case of fracture, when he must place one hand on each side of the broken bone, so as to steady it. No. 4, when the word "Ready" is given, should place himself opposite No. 2, stoop down,

and lock his hands with No. 2 under the Patient's body. If the Patient be able to help, he should clasp his hands round the neck of No. 1.

4. "LIFT."

On the word "Lift" the Bearers raise the Patient gently and rest him on their knees; as soon as he is securely rested, No. 4 runs round by the head of the stretcher and places it under the Patient, being careful that the pillow is immediately under the Patient's head; he then stoops down and locks his hands with those of No. 2.

5. "LOWER."

At the word "Lower," Nos. 1, 2, and 3 carefully lower the Patient down to the stretcher, while No. 4 at the same time assists in supporting and placing him on it.

6. "STAND TO STRETCHER."

On this order being given, each Bearer stands up:—No. 1 goes to the head of the stretcher, with his face towards the Patient; No 2 to the foot, with his back to the Patient; while Nos. 3 and 4 remain in position on each side of the stretcher.

7. "READY."

Nos. 1 and 2 grasp the handles of the stretcher, having previously adjusted their shoulder-straps, in case they are using them.

8. "LIFT."

At this word, Nos. 1 and 2 Bearers raise the stretcher steadily together and stand up.

9. "MARCH."

All being ascertained to be in order, on the word "March" being given, Nos. 1 and 2 Bearers move off:—No. 1 stepping off with his left foot and No. 2 with his right foot. Nos. 3 and 4 march on each side of the stretcher. On arriving at the place of destination, the following orders are successively given:—

10. "HALT."
11. "LOWER."
12. "UNLOAD STRETCHER—READY."
13. "LIFT."
14. "LOWER."

N.B.—These orders, viz., Nos. 10 to 14 inclusive, are to be carried out in a similar manner to orders Nos. 13 to 17 in Exercise No. 1.

STRETCHER EXERCISE, No. III.

When only three Bearers are available, and the space is limited as before, the following alterations must be made in the foregoing (No. 2) Exercise.

1. The Instructor numbers the Bearers—1, 2, 3.
   All orders will be given by No. 3.

. "PLACE STRETCHER."

No. 1 Bearer places the stretcher on the ground by the side of the Patient, and as close to him as practicable.

3. "FALL IN."

The three Bearers take the same positions on one side of the Patient as laid down in Exercise No. 2.

4. "READY."

Nos. 1, 2, and 3 kneel down, placing themselves as close to the Patient as they conveniently can, and then take hold of him as directed in Exercise No. 2.

5. "LIFT."

Nos. 1, 2, and 3 raise the Patient as directed in Exercise No. 2.

6. "LOWER."

At the word "Lower," Nos. 1, 2, and 3 lean forward so as to carry the Patient over the stretcher, and then carefully lower him down upon it.

7. "STAND TO STRETCHER."

At this direction No. 1 goes to the head of the stretcher, No. 2 to the foot, and No. 3 remains in position at the side of the stretcher.

The remainder of this Exercise will be precisely the same as is given in Exercise No. 2, from orders 7 to 14, both included—the instruction for No. 4 Bearer to walk by the side of the stretcher being alone omitted.

STRETCHER EXERCISE, No. IV.

For use in Mines and narrow Cuttings, where two men only can be engaged.

Necessary First Aid having been given, Nos. 1 and 2 will carefully place the stretcher in a line with the injured man's body, the foot of the stretcher being, if possible,* close to his head.

No. 1 will give the word "**Ready,**" when both get into position as follows :—

No. 1 places his feet one on each side of the Patient between his body and arms, the toe of each foot as near the armpits as possible, standing over the man. He then stoops down and passes his hands between the sides of the chest and the arms underneath the shoulders, and locks the fingers.

If the Patient's arms be uninjured he may put them round the neck of No. 1, and by this means greatly assist him in lifting.

No. 2 at the same time places his right foot between the calves of the injured man's legs, as close to the knees as possible, and his left foot at the injured man's right side, close to the crest of the hip ;† he then kneels down and passes his arms round the outside of the Patient's

* It is not advisable to be too particular as to the head or foot of a stretcher in a mine, as it would probably be quite impossible to reverse it, and it is always competent for the Bearers to lower the pillow.

† When the Patient's legs are in splints and tied together, the feet of No. 2 must necessarily be placed outside.

thighs at the lowest part, and locks his fingers behind just at the bend of the knees.

When both are ready, No. 1 will give the order, "**Lift and move forward.**" The Patient is then to be slowly lifted just sufficient to allow his body to clear the stretcher. Both Bearers will slowly and gradually move forward, No. 1 by very short steps, and No. 2 by bending his body forward over his left thigh, by which means he exercises a pushing movement which very greatly assists No. 1. No. 2, when he has bent his body forward as much as he can without moving his feet, advances his right foot to his left, then again advances his left foot, and bends his body forward. This movement is to be repeated until the Patient is laid on the stretcher.

The Bearers will then act in the ordinary manner, as far as the nature of the locality will permit.

Chapter X.

By E. MacDowel Cosgrave, M.D., F.R.C.P.I.

PREPARATION FOR RECEPTION OF ACCIDENT CASES.

When news of an accident comes, preparations should at once be made so as to have everything ready before the injured person is brought in. Of course the preparations needful will vary according to the nature and extent of the injury, but the following are the chief things which may have to be done.

CHOICE AND PREPARATION OF ROOM.

A room must be chosen. In a bad case this should be one easily reached, as it is difficult to carry an injured person through narrow passages and up stairs. Unless there is some such reason against it, the injured person's own room is best.

The way to the room must be cleared, projecting furniture and loose mats in the hall or in lobbies should be removed. If the injured person is carried on a door or shutter, or even on a stretcher, a couple of strong kitchen chairs should be placed ready to support it wherever the bearers would be likely to require rest.

Useless furniture should be removed from the bedroom. The bed should be drawn out from the wall so that both sides can be approached, and the clothes turned back to one side to their full length. A hot bottle should be got ready. If there is much collapse several hot bottles and hot blankets may be required; cover the hot bottles with flannel.

If the injury is very severe, if mud-stained clothes have to be removed, or if extensive dressings have to be applied, it may be necessary to have another bed, a couch, or a table placed near the bed to lay the sufferer on in the first instance. This should be so arranged that soiling may do no harm; old sheets, waterproof material, thin oilcloths, or even newspaper, may be used as a protection.

LIFTING AND CARRYING.

If present at the place where the accident occurred, it will be necessary to see that the patient is carefully lifted after proper "First Aid" has been rendered.

The following rules should be remembered :—Select the proper number of persons to assist, and do not let them lift the patient until they thoroughly understand how they are to do it.

For ordinary cases, where the injured person has to be lifted a very short distance, three helpers are sufficient. Two (who should be as far as possible of equal height) are to bear the weight, the third is to support and take charge of the injured part. This is best done by a person who has been through a "First Aid" course.

If the injured person is insensible, another helper should support his head.

The lifters, one at each side, should kneel on one knee, and pass their hands under the patient's back at the lower part of the shoulder-blades, and under the hips, clasping each his right hand in the other's left. The injured patient should, if practicable, place his arms round the necks of the bearers.

The third helper should attend to the seat of injury ; if this is a fractured limb, he should support it by placing the palms of his hands under the limb, one above and one below the seat of the injury, grasping it firmly but avoiding unnecessary pressure.

The helpers should remain thus until the order "Lift" is given, and then they should all lift slowly and steadily, avoiding jars, attempts to change position of hands, &c.

If the injured person is to be placed on a stretcher or shutter, this should be previously placed with the bottom end at his head; the bearers should then move, one at each side of it, until the patient is over it. The word "Lower" should then be given, and the injured person should then be slowly lowered. A pillow or folded-up coat should be ready, and as the sufferer is lowered, this should be placed under his head.*

MEANS OF CARRYING.

Besides a stretcher, and substitutes such as a gate, a shutter, or a door, other means of carrying can be improvised.

In slight injuries, where the injured person is unable to walk, two bearers can carry him by forming a four-handed, three-handed, or two-handed seat.

A four-handed seat is thus formed:—To distinguish the helpers they are designated A and B. Each helper grasps with his left hand the wrist of his right hand; A then grasps with his right hand the left wrist of B, whilst B with his right hand grasps the left wrist of A. Thus a square seat is made. (Fig. 35.) The helpers stoop

* Full directions are given in Chapter IX.

down, the injured person sits on the hands, and places his arms on the shoulders or round the necks of the helpers, who then rise. The helpers must advance sidewards, very slowly and keeping in step.

A three-handed seat is thus made :—A grasps his right wrist with his left hand, with his right hand he grasps B's right wrist, and B's right hand grasps A's left wrist. B then places his left hand on the right shoulder of A, and a seat with a back to support the injured person is made.

A single helper can lift by supporting with one arm the two knees, and with the other the back. The arms must be passed well under before commencing to lift.

A single helper can give support by putting his right arm round the waist, grasping the right hips and placing the injured person's left arm round his own neck, holding the left hand with his own left hand.

A capital stretcher can be improvised out of a strong sheet and two broom handles or other short poles. Each side of the sheet is wound up on a broom handle until there is just room for a person to lie between. This requires four bearers, two at each side, to prevent the sheet slipping.

CARRYING UP STAIRS.

In carrying a stretcher up stairs the head should go first, and an extra helper should assist at the lower end

so as to raise it and keep the stretcher nearly horizontal.

The two, three, or four-handed seat may be used for carrying up stairs ; or a strong chair, the patient being carried up backwards. In the latter case one helper should walk after the chair and help to support it, and to prevent the injured person slipping out.

LIFTING INTO BED.

If the bed is narrow and there is room the stretcher should be placed on the floor with the head close to the foot of the bed. The injured person should then be lifted over the foot and placed on the bed. If the bed is too wide to admit of this, the stretcher should be placed beside it, and two helpers should stand at the far side of the stretcher. One helper passes one arm beneath the shoulders and one beneath the middle of the back, the other helper placing his under the lower part of the back and under the knees. The injured person is then lifted, another helper pulls away the stretcher, and after a single step forward the burden is placed on the bed.

PREPARATION OF BED.

A firm mattress, not a feather bed, should be selected. If there is much injury, or if dressings have to be applied, a draw-sheet ought to be placed on the bed. It should be of four or more thicknesses, extend across the bed.

and reach from the middle of the patient's back to the knees. A piece of waterproof sheeting or of thin oil-cloth should be placed under the draw-sheet. As the draw-sheet becomes soiled, the soiled portion should be rolled up and a clean part drawn smoothly under the patient.

In fracture of the leg or thigh, sprained ankle, and some other cases, a "cradle" should be improvised. The use of a "cradle" is to support the bed-clothes and keep them from pressing on the limb. Bandboxes, three-legged stools, and similar articles may be used. A cork-screw passed through the bed-clothes with its point guarded by a cork, and tied by string to the bed or a nail in the wall, will relieve the pressure of the bed-clothes effectually.

REMOVING THE CLOTHES.

In taking clothes off an injured person a few rules should be borne in mind.

In serious cases it is much better to sacrifice the clothes than to run any risk of increasing the injury.

In removing a coat, &c., in a case of fractured arm, the uninjured arm should be drawn out first.

In putting on anything the injured arm should be put in first.

In burns and scalds nothing should ever be dragged off. A *sharp* pair of scissors should be used, and every-

thing not adhering should be cut away. If anything adheres it should be left until medical aid can be obtained. The clothing adhering may, with advantage, be soaked with oil. To remove the trousers from a severely injured limb, the *outside* seam should be ripped up.

PREPARATIONS FOR SURGEON.

As soon as the injured person has been attended to preparation should be made for the surgeon's visit.

The preparations needful will depend upon the nature of the case. The following hints may be of use :—

A fire in the room will generally be of service, even in summer. There should be plenty of water, both hot and cold, also several basins, plenty of clean towels and soap. There should be something to empty water into ; a foot-bath does well. The basins should be placed on a table, covered with a clean white cloth ; a large towel makes a suitable cloth ; the towels, folded up, should be placed on the same table, and the hot and cold water should be within easy reach. The foot-bath should be under the table or close at hand.

In the case of a burn, cotton wadding, soft cloths, old linen, oil, flour, bread, and bicarbonate of soda (baking soda), should be ready, and materials should be torn up for bandages. If a chemist's shop is within reach, carron oil and plenty of cotton wool should be sent for.

In the case of hæmorrhage, sponges, plenty of water, and at least two basins should be ready.

In the case of a person rescued from drowning the sheets should be taken off the bed, plenty of blankets should be heated before the fire, and several hot bottles should be ready.

If poultices are likely to be required, boiling water, linseed-meal, mustard, a loaf of stale bread, a small basin, a large spoon, sweet oil, and tow, flannel or handkerchiefs may be required.

For fomentation, have boiling water, flannel, a kitchen roller, and two sticks, or a large towel.

When summoning a medical man to an accident always let him know what kind of case he is required to treat, so that he may bring whatever is needful. By this means valuable time may be saved.

INDEX.

ABDOMEN, 11
Acids, poisoning by, 55
Adder bites, 53
Air-cells, 23
Alcohol, poisoning by, 50
Alkalies, ,, ,, 55
Animals, bites of, 52
Apoplexy, 46
Arches in foot, 15
Arms, 14
Arm-sling, small, 70
,, ,, large, 69
Arm, fracture of, 38
Arteries, 18
Artery, brachial, 28
,, face of, 30
,, femoral, 31
,, head of, 30
,, lips of, 31
,, sub-clavian, 30
,, temporal, 31
,, pulsation in, 22
Arterial bleeding, 26
,, ,, treatment of, 26
Artificial respiration, 58
Auricles, 20

BALL AND SOCKET JOINT, 15
Bearers, 2 for stretcher, 89
,, 3 ,, ,, 81
,, 4 ,, ,, 85
Bed, lifting into, 95
,, preparing, 95
Bites of animals, 52
Bleeding from arm, 28
,, ,, armpit, 30
,, ,, foot, 31
,, ,, fore-arm, 28
,, ,, head, 31
,, ,, leg, 31
,, ,, nose, 26
,, ,, palm, 27
,, ,, thigh, 32
Blood, use of, 17
,, impure, 21
,, pure, 21
Bones, 11
Bone, brooch, 15
,, collar, 14
,, shin, 15
,, thigh, 15
Bone, broken, 33
,, dislocated, 35
Brachial artery, 28

Brain, compression of, 48
,, concussion of, 48
Breathing, stertorous, 46
Burns, 53

Capillaries, 18
Capillary bleeding, 25
,, ,, treatment, 25
Carbolic acid poisoning, 56
Carbonic acid, 21
Carrying patients, 71
Cartilage, 15
Cervical vertebræ, 13
Chest, 13
Choking, 62
Circulation, organs of, 17
Clavicle, 14
Clothes, removing, 96
Coat stretcher, 74
Collar-bone, 14
Comminuted fracture, 33
Complicated ,, 33
Compound ,, 33
Compression of brain, 48
Concussion ,, ,, 48
Cord, spinal, 13
Crepitation, 34
Cuts, 45

Diagram of Heart, 19
Diaphragm, 21
Dislocation, signs of, 35
,, treatment, 35
Distortion in fractures, 34
Dorsal vertebræ, 13
Dress on fire, what to do, 54
Drowning, 58
Drunkenness, 50

Ear, Foreign Body in, 57
Elastic Bandage Tourniquet, 27
Epilepsy, 47
Esmarch's bandage, 64
Expiration, 23
Eye, foreign body in, 57

Fainting, 49
Falling Sickness, 47
Femoral artery, 31
Femur, 15
Fibula, 15
Finger, bones in, 14
Foot, 15
Foreign body in eye, 57
Four-handed seat, 71
Fractures, 33
Fracture of arm, 38
,, ,, collar-bone, 37
,, ,, fore-arm, 38
,, ,, fingers, 39
,, ,, hand, 39
,, ,, jaw, 36
,, ,, knee-cap, 43
,, ,, leg, 42
,, ,, ribs, 39
,, ,, skull, 35
,, ,, spine, 43
,, ,, thigh, 40
Fracture, signs of, 34

Fracture, comminuted, 33
„ complicated, 33
„ compound, 33
„ simple, 33
„ distortion in, 34
Frostbite, 54

Gas, Poisoning by, 63

Hæmorrhage, 25
„ arterial, 26
„ capillary, 25
„ venous, 25
Hanging, 63
Haunch-bone, 13
Head, 12
„ injuries to, 48
Heart, 18
„ diagram of, 19
„ sounds of, 21
„ valves of, 19
Hinge-joint, 15
Humerus, 14
„ fracture of, 38
Hysterical fits, 51

Impure blood, 21
Insensibility, cause of, 46
„ examination in, 46
Inspiration, 23
Intoxication, 50

Jaw, 12
„ fracture of, 36
Joint, 15
„ cartilage in, 15
„ lubrication of, 15
„ kinds of, 15

Knee-Cap, 15

Laudanum poisoning, 51
Leg, 15
„ fracture of, 42
Lumbar vertebræ, 13
Lungs, 22

Midriff, 21
Muscles, 16
„ at rest, 17
„ in action, 17
„ structure of, 17
„ tendons of, 17

Nerves, motor, 24
„ sensory, 24
„ sympathetic, 24
Nose bleeding, 26

Opium poisoning, 51
Oxalic acid poisoning, 56
Organs of circulation, 17
„ respiration, 21
Oxygen, 24

Pain in fracture, 34
Palm, bones in, 14

Pick-a-back carrying, 74
Poisoning by acids, 55
„ „ alcohol, 50
„ „ alkalies, 55
„ „ carbolic acid, 56
„ „ gas, 63
„ „ opium, 51
„ „ oxalic acid, 56
Phosphorus, 56
Preparation for surgeon, 97
Pulsation in arteries, 22
Pure blood, 21

Rabid animals, bites of, 52
Radius, 14
„ fracture of, 38
Respiration, 21
„ artificial, 58
„ organs of, 21
Ribs, 13
„ fracture of, 39
Room, choice of, 91

Sack-stretcher, 75
Scalds, 53
Scapula, 13
Seat, 2-handed, 72
„ 4-handed, 71
Shin-bone, 15
Shoulder-blade, 13
Signs of dislocation, 35
„ fracture, 34
„ insensibility, 46
Simple fracture, 33
Skeleton, 11
Skull, 12
Sling for arm, 70
Snake bites, 53
Sound of heart, 21
Special fractures, 35
Spinal cord, 13
Spine, 12
Splints, temporary, 43
Sprains, 45
Stretchers, 79
„ temporary, 75
Sub-clavian artery, 30
Suffocation, 63
Sunstroke, 55

Temporary splints, 43
Tendon, use of, 17
Thigh-bone, 15
„ fracture of, 40
Thorax, 13
Tibia, 15
„ fracture of, 42
Tobacco, use of, dangerous in bleeding, 32
Tourniquet, temporary, 26
Trachea, 22
Triangular bandage, 64
„ „ broad, 65
„ „ narrow, 65
„ „ for back, 71
„ „ „ cheek, 66
„ „ „ chest, 71
„ „ „ eye, 66
„ „ „ foot, 69
„ „ „ forehead, 66
„ „ „ hand, 68
„ „ „ hip, 67
„ „ „ scalp, 65

Triangular bandage for shoulder, 66
Trunk, 11
Two-handed seat, 72

Ulna, 14
Use of blood, 17

Valves of Heart, 19
Varicose veins, 25
Veins, 18
Venous bleeding, 25
Ventilation, 24
Ventricles, 20
Vertebral column, 12
Vertebræ, cervical, 13
,, dorsal, 13
,, lumbar, 13

Waggons, to load, 78
,, unload, 78
What to do when dress catches fire, 54
Wind-pipe, 22
Wounds, 52
Wrist, 14

St. John Ambulance Association

(STORES DEPARTMENT).

General Price List.

Ashford Litters.—Consisting of a folding stretcher and removable cover on a two-wheeled under carriage, fitted with elliptical springs. Any improved pattern Furley stretchers supplied by the Association can be used with the same under carriage.

Prices.	£	s.	d.
Under carriage alone	8	5	6
,, with Ordinary Stretcher and Cover	11	0	0
,, with Military ,, ,,	11	5	0
,, with Telescopic-handled Stretcher and Cover	11	10	0
,, with Regulation Police Stretcher and Cover	12	1	0
Cover alone	0	15	0
Superior hood and apron	2	10	0
Waterproof sheet	0	10	6
India-rubber tyres to wheels, extra	4	10	0
Stretchers (Furley improved pattern) :—			
Ordinary, fitted with self-raising pillow	2	2	0
Ditto, fitted with telescopic handles, by means of which the length can be reduced from 8 feet to 6 feet	2	10	0
Military, exact size of army regulation pattern, recommended for use of the ambulance brigade	2	5	0
Police, very strong, and provided with straps	3	3	0
Cover for Stretcher	0	15	0
Spare Bed for do.	0	10	6
Army Rug, to cover patient on stretcher	0	5	6
Superior Rug, fitted with air-cushion, for use on stretcher or when travelling	1	5	0

	£	s.	d.
Lowmoor Jacket.—For securing a patient on a Stretcher, which can then be placed in an upright position .	1	5	0

Horse Ambulance Carriages.—Full particulars, estimates (which vary from £50 to £150), and list of places supplied, can be obtained on application.

Ambulance Hampers.—With Waterproof Covers and Straps.

Small, containing one set of splints; one elastic tourniquet; three tampons; two packets of patent lint; four roller bandages (wide and narrow); four triangular bandages; cotton wool, marine lint, patent plaister, in tin cases; knife, scissors, thread, needles, pins, &c., &c., &c. Weight, complete, 6½lbs.; length, 1 ft. 6 in.; depth, 5 in.; width, 7 in. Suitable for use in factories, collieries, mines, railway stations, shipbuilding yards, and for volunteer corps, &c., as well as for domestic use	1	11	6
Large, with a much more complete outfit . . .	6	6	0
Loring's Patent Ambulance Kit	1	16	0
Bandages.—Plain triangular . . . . per doz.	0	4	6
Roller (2½ in. 4 yds. long and 3 in. 6 yds. long) ,,	0	2	0
Illustrated triangular (after Esmarch), showing 14 applications of the triangular bandage, with printed instructions, each 6d. . . . . per doz.	0	4	6
Bandage rolling machine, invaluable to Nursing Classes	0	2	6
Tourniquets.—Esmarch's Elastic	0	1	6
Field	0	2	0
Tourniquet Braces, for use as ordinary braces, or as an elastic tourniquet	0	2	6
Splints, wooden . . . . . per set	0	2	6
,, cane	0	7	6
Cotton wool . . . . . per lb.	0	1	9
Lint . . . . . ,,	0	2	0

Plaister, strapping, antiseptic dressings, and all kinds of bandages; prices on application.

Books.—"First Aid to the Injured." By the late Surgeon-Major Peter Shepherd; Revised by Robert Bruce, M.R.C.S. The authorised text-book for the First Aid Course. 1s.; by post, 1s. 1d.

Ditto, Welsh Edition, same price.

"Hints and Helps for Home Nursing and Hygiene." By E. MacDowel Cosgrave, M.D. The authorised text-book for the Nursing Course. 1s.; by post, 1s. 2d.

"Questions and Answers upon Ambulance Work." By John W. Martin, M.D., of Sheffield, and John Martin, F.R.C.S. Ed., of Huddersfield. 1s.; by post, 1s. 1d.

"Questions and Answers upon Nursing." By John W. Martin, M.D. 1s. 6d.; by post, 1s. 8d.

"First Aid to the Injured (Five Ambulance Lectures)." By Prof. Frederich Esmarch. Translated from the German by H.R.H. Princess Christian. 2s.; by post, 2s. 2d.

"Elementary Bandaging and Surgical Dressing." By Walter Pye, F.R.C.S. 2s.; by post 2s. 1d.

Specimen Examination Papers, First Aid and Nursing Course, 3d.; by post, 4d.

Diagrams.—Large (for lecturers' use), comprising the Human Skeleton, the Arterial and Venous System, the Heart and Circulation of the Blood, Fractures (Simple and Compound), and Dislocations. Printed in colours. Per set of six, 15s.

Small, showing the main arteries and points where pressure should be applied to arrest bleeding. 2d.; by post, 3d.

Aide Mémoire.—On cardboard, in linen-lined envelope, for the pocket. By the late Surgeon-Major P. Shepherd. Containing useful hints for First Aid to the Injured. 3d.; by post, 4d.

Nursing Charts, designed by Miss Inderwick, and Temperature Charts, in sets containing seven of each. Per set, 6d.; by post, 7d.

	£	s.	d.
Registers.—Class Attendance and Certificate (two to set)	0	6	0
Case Report	0	1	0
Ice-Ball (Rüdel's), with line complete, for use in ice accidents	0	10	6

Arm Badges, with the device, issued under the authority of the Central Executive Committee, having been first approved by H.R.H. the Grand Prior as the sole official and recognised Badge of the Association and Brigade.

No. 1, for the use of individual certificated pupils—	£	s.	d.
In German Silver	0	0	9
In Electro Plate	0	2	0
In Cloth and Silk	0	0	9
In Cloth and Silver	0	2	0

No. 2, for members of the St. John Ambulance Brigade, having the name of the corps annexed on a label; only issued in quantities—

In German Silver, first doz., £1; subsequent dozs., 12s.
In Electro Plate, first doz., £1 12s.; subsequent dozs., £1 4s.
In Cloth and Silk, per doz., 12s.
In Cloth and Silver, per doz., £1 10s.
Special quotations for large quantities.

Electrotypes of above device—	£	s.	d.
Small, for Stationery and Circulars	0	1	0
Large, for Posters	0	1	6

Flags bearing the above device—	£	s.	d.
12 feet by 6 feet . .	1	7	6
5 feet by 3 feet . .	0	12	6

Boxes of Stationery for the use of Class Secretaries and others connected with the Association, containing twelve sheets of high-class paper, suitably headed, and twelve envelopes bearing the badge of the Association. Price 6d.; by post, 9d. Twice that quantity, price 1s.; by post, 1s. 3d.

Medallions, issued in accordance with special regulations, for which see leaflet No. 62, to be had on application.

Bronze, 2s.; Silver, 7s. 6d.; Gold, £2 10s.;
including engraving name and register number on back.
Morocco velvet-lined case . . . 2s.

All orders for stores should be given to the Local Secretary, or the Stores Department, St. John Ambulance Association, St. John's Gate, Clerkenwell, E.C.

Small Pocket Certificates, folding in two and bound in morocco, price 6d. each (by post 7d.), can be obtained by Certificated Pupils from the Secretary on application through the Local Secretaries of Centres or Detached Classes,

KU-359-876